JOYOBRATA DAS

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Visit :my_portfolio~`

ACADEMIC PROJECTS

RAG-Powered Indian Healthcare Policy Assistant

Github

Tech Stack: Python • LangChain • Chroma DB • Ollama (Gemma3) • Sentence-Transformers • Streamlit • PyPDF

- Implemented a fully local document ingestion pipeline utilizing LangChain's SemanticChunker and all-MiniLM-L6-v2 embeddings to parse policy PDF documents and split them based on sentence-level semantic distance thresholds.
- Integrated Chroma DB with a Cosine Similarity index for retrieval, and built a conversational history engine using Ollama (gemma3:4b) to automatically rewrite chat history into standalone, searchable queries.
- Developed a dual-mode Streamlit web interface supporting direct single-turn Q&A with expandable page-referenced source citations, and advanced multi-turn chat with persistent session state management.

Neural Netwroking From Scratch

Github

Tech Stack: Python • NumPy • Object-Oriented Programming (OOP) • Linear Algebra • Matplotlib

- Implemented a complete feedforward neural network from scratch using Python and NumPy without high-level deep learning frameworks, developing Dense Layers, ReLU, Softmax, Categorical Cross-Entropy Loss, Forward & Backward Propagation, Gradient Descent, and Parameter Optimization.
- Trained the neural network on classification datasets while designing a modular, object-oriented architecture for extensibility and experimentation, with ongoing implementation of additional neural network components.

Crop Automation : AI-Powered Agricultural Decision Support System

Github

Tech Stack: React • Flask • Python • Google Earth Engine • Scikit-learn

- Developed a satellite-based agricultural monitoring dashboard using React, Flask, and Google Earth Engine, integrating GIS visualization, dynamic geolocation, satellite-derived vegetation, and suitability maps for location-specific crop monitoring, stress analysis, and agricultural insights.
- Implemented a Random Forest-based crop recommendation pipeline and designed an end-to-end agricultural decision support system for irrigation, crop monitoring, and intelligent decision-making.

Chandrayaan-3 Inspired Lunar Rover Model

The Telegraph: 19 Jan 2024

- Developed and exhibited a student-built lunar rover prototype model inspired by India's space mission, showcased during EXORGIC 2024. Recognition on Telegraph

EXPERIENCE

Web Developer | School of Data Science & Forecasting, DAVV

Website

Nov 2025 – Present

- Developed and deployed the official School of Data Science & Forecasting website using PHP, HTML, CSS, and JavaScript.
- Implemented reusable components using PHP includes for better maintainability.

TECH STACK

Languages: Python, Java, C++, JavaScript, PHP, SQL

Web & Development: React, Flask, REST APIs, HTML/CSS, Vite

AI & Data Science: Machine Learning, Scikit-Learn, Pandas, NumPy, Data Analysis, Computer Vision

Tools: Git, GitHub, Linux, SQLite

EDUCATION

M.Tech Integrated Degree in Artificial Intelligence & Data Science

School of Data Science & Forecasting, DAVV, Indore | Expected Graduation: 2029

St. Joan's School (Class XI & XII)

ICSE Class X, ISC Class XI & XII

SKILLS

- Art (visit @joyobrata_05) | Editing | Graphic (visit @the_terabyteframes)