Hema Ramachandran

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github.com/HemaRamachandran28 hema-portfolio-theta.vercel.app

PROFILE

AI & Data Science undergraduate skilled in Python, RAG pipelines, machine learning, and data analytics, with experience in building AI applications and data-driven solutions.

EDUCATION

B. Tech Artificial Intelligence and Data Science – 87% 09/2023 – Present | Chennai, India
St. Joseph's Institute of Technology

INTERNSHIP – EXPERIENCE

Data Analytics Intern 08/2024 – 09/2024 | Chennai, India
kaashiv Infotech

- Developed an automated ETL pipeline using Python and Pandas to ingest multi-state macroeconomic datasets, reducing data preparation latency.
- Engineered interactive Power BI dashboards tracking high-variance commodity price anomalies to support strategic market-entry evaluations.
- Optimized complex SQL queries and statistical aggregations on raw usage logs, accelerating data retrieval times for analytics workloads.

SKILLS

- **Programming Languages:** Java, SQL, Python
- **AI & Machine Learning:** Retrieval-Augmented Generation (RAG), Large Language Models (LLMs), Prompt Engineering, Vector Databases (ChromaDB), Model Evaluation Metrics
- **Frameworks & Libraries:** LangChain, FastAPI, Streamlit, scikit-learn, Pandas, NumPy, Matplotlib
- **Tools:** Power BI, Knime, Excel
- **Data Analytics & Tools:** Power BI, KNIME Analytics, Excel, Jupyter Notebook, Git, VS Code

PROJECTS

01/2026

Dynamic cluster formation and Fuzzy Logic–Based CH Selection

- Created a dynamic clustering system using a Mamdani Fuzzy Inference System to automate Cluster Head (CH) selection.
- Extended network lifetime by 24% and cut node energy loss by 17% using an adaptive algorithm based on residual energy, mobility, depth, and link quality..
- Implemented Python-based defuzzification to convert linguistic rules into precise, real-time crisp values for routing optimization.

Private RAG Chatbot: Full-Stack AI Document Assistant 09/2025

- Engineered a full-stack, localized RAG pipeline using LangChain, ChromaDB, and a FLAN-T5 LLM to process over 100 sensitive PDF documents locally.
- Improved retrieval precision and reduced hallucination rates by implementing optimized token-based recursive chunking and tailored system prompt engineering.
- Designed an asynchronous backend architecture with FastAPI and a Streamlit UI, enabling concurrent document querying with minimal latency.
- Deployed the architecture to Hugging Face Spaces using secure API authentication and environment-variable secrets management.

CERTIFICATIONS & LEARNING PATHS

- **KNIME Basic Proficiency (L1)** – KNIME Analytics
- **Python for Data Science, AI & Development** – IBM (via Coursera)
- **160 Days of Problem Solving** – GeeksforGeeks (Data Structures & Algorithms curriculum)