

Hariharan S

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SUMMARY

With over three years of hands-on experience as a key member of product team in developing and maintaining web applications. My expertise lies in Python scripting with a strong emphasis on logical thinking and problem solving. Proficient in data analysis and Machine Learning, Generative AI and strong knowledge in backend development and Dockerization. Dedicated in providing finest solutions aligned with business requirements. A rapid learner and well-equipped to excel in dynamic tech environments.

EXPERIENCE

Product Research Engineer | TCS TwinX

August 2024 – Present

GenAI And Data Science

- Led the end-to-end implementation of **LLM** within the product, developing a multi-agentic architecture using Python, **LangChain** and **LangGraph**. Implemented **Corrective-RAG** and **ReAct** techniques to enable LLM interactions with Digital **Twin** and simulation models for data insights. the domains of banking, retail, telecom, supply chain and life science.
- Designed control flow and reasoning logic for LLM to provide strategic insights and decision-making based on entity twin data. With the integration of Google **Vertex Gemini** and **LLaMA** models, while also building domain-specific knowledge using quantization techniques on pre-trained models.
- Conducted data analysis to optimize business processes for a major **European** service provider by modeling milestone durations and identifying data quality issues.
- Analyzed shipment delays for a Major **European** retailer, using EDA to address pain points like **lead time**, delivery partners, and regions, and predicted shipment delays.
- Studied customer churn and **Winback** campaign strategies for a major **Indian** and **Finnish** telecom provider.
- Built an **ML workbench** for feature engineering, data splitting, model training, and selection, enabling automated deployment of the best model on the server while supporting multiple data sources.

Python Backend development

- Developed **real-time ETL** pipelines using NiFi and Kafka to ingest data from RDBMS, APIs, flat files for KPI aggregator and data ingestion. Built a **Django** backend with Materialized Views for KPIs and **EDA** insights.
- Managed deployment and **dockerization** of applications and backend components in the client and product environment.
- Built **multiple** other product backend components

Developer | TCS TwinX

October 2021 - July 2022

- Redesigned a **monolithic** component into an **Event-driven**, object-oriented system using the **Singleton** pattern for efficient database connections. Enabled event-driven **Kafka** message consumption and processing based on Digital twin configurations and defined rules.
- Developed **REST** APIs with Django for **Digital Twin** configurations and journey definitions, reducing setup time. Built an SMTP mailing system.

PROJECTS

AI Insight Assistant

- Designed an **AI-driven** system for data analysis, strategic decision-making, and insights generation. Leveraged **agentic architectures** with LLMs and frameworks like **LangChain**, **LangGraph** and techniques like **ReAct** and **RAG** to interpret the complex data and provide insights.
- Features include company profile retrieval (market cap, earnings, margins), **real-time news** search via **Google Custom Search API**, **SQL RAG** for stock data analysis, and Python code execution for advanced analytics and charting all integrated as tools.

EDUCATION

B.E - Mechanical Engineering

RMK Engineering College

Sep 2017 - Aug 2021

Aggregate GPA: 8.3/10

Higher Secondary School

I.V.L. Matric. Hr. Sec. School

2016 - 2017

Percentage - 88%

SKILLS

- **Programming & Development:** Python, Django, Flask, OOPs, Design Patterns
- **AI:** Generative AI, LLMs, RAG, ReAct, LangChain, LangGraph, CoT, Prompting.
- **Data Science & ML:** Feature Engineering, Data Preprocessing, EDA, Predictive Modelling, Data Visualization (Matplotlib, Seaborn, Plotly), Scikit-learn
- **Databases:** PostgreSQL, SQLite, MySQL, MongoDB, Redis
- **Cloud & DevOps:** Google Cloud Platform (GCP), AWS, Docker, GitHub, GitLab
- **Other Tools & Libraries:** ETL Pipelines, Apache Kafka, Apache NiFi and other python libraries.