Rajinikanth B

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DATA SCIENTIST WITH AI ML ENGINEER

Data Scientist with 5+ years of hands-on experience across data engineering, analytics, and applied machine learning in banking, healthcare, retail, and insurance domains. Proficient in building scalable data pipelines, performing statistical analysis, developing production-ready ML and GenAI systems, and deploying data solutions on AWS, Azure, and GCP. Strong foundation in Python, SQL, cloud platforms, and MLOps practices, with a practical approach to transforming raw data into reliable, explainable business insights.

Passionate about building trustworthy, governed AI systems that balance innovation with safety, auditability, and real-world impact. Motivated to design production-grade AI/GenAI platforms that enable responsible decision-making and deliver measurable value to business stakeholders.

TECHNICAL SKILLS

Programming	Python, SQL
ML & DL	Scikit-learn, TensorFlow, PyTorch, XGBoost, LightGBM, CatBoost, BERT, GPT Models
GenAI / LLMs	OpenAI APIs, Hugging Face Transformers, LangChain, LangGraph, LangSmith, CrewAI, AutoGen, RAG Architectures
AI Agents	LangGraph Agents, CrewAI Agents, Rule-based Decision Agents, Multi-Agent Evaluation Pipelines
Vector Databases	FAISS, Pinecone, Chroma, Milvus
ML Algorithms	Regression, Classification, Ensemble Methods, Gradient Boosting, Clustering, Time-Series Models, CNN/RNN architectures, Transformer-based models
Data Engineering	PySpark, Kafka, Snowflake, BigQuery, Redshift, ETL/ELT Design
MLOps	MLflow, Airflow, Kubernetes, Docker, Terraform, FastAPI, GitHub Actions, Azure DevOps, n8n, Cursor AI, MCP
Cloud	AWS (S3, Lambda, ECS, SageMaker), Azure (Azure ML, AKS, Azure OpenAI), GCP (BigQuery, Vertex AI)
Evaluation & Safety	SHAP, LIME, RAGAS, BLEU/ROUGE, ROC-AUC, Prompt Safety Testing, Bias Analysis
Visualization	Tableau, Power BI, Plotly, Matplotlib, Seaborn

PROFESSIONAL EXPERIENCE

American Express: Enterprise Treasury & Liquidity Intelligence GenAI Platform **jan 2025 - Present**

Role: GenAI Engineer

Project Overview

Built a GenAI-powered decision-support platform for treasury and finance teams to analyze liquidity positions, cash flow forecasts, funding strategies, and regulatory liquidity disclosures using grounded, explainable insights.

Roles & Responsibilities

1. **Designed a Retrieval-Augmented Generation (RAG) architecture** to ingest treasury reports, cash flow statements, liquidity stress scenarios, and regulatory disclosures (LCR / NSFR documentation), enabling grounded financial reasoning.
2. **Built document ingestion and preprocessing pipelines** using Python to parse structured (CSV, Excel) and unstructured (PDF, policy docs) treasury data, storing embeddings in a single FAISS vector store.
3. **Implemented multi-step AI agent workflows using LangGraph**, enabling agents to reason across cash positions, funding gaps, and liquidity buffers before generating contextual explanations.
4. **Developed modular GenAI pipelines with LangChain**, integrating prompt versioning, traceability, and evaluation using LangSmith to ensure audit-ready responses for finance stakeholders.
5. **Integrated AWS-native data pipelines** using S3 for storage, Lambda for ingestion orchestration, and ECS-hosted FastAPI services for real-time GenAI inference.
6. **Applied governance and safety controls**, including source citation, confidence scoring, and response validation to meet internal risk, compliance, and audit requirements.
7. **Improved developer velocity by ~30%** using Cursor AI with MCP for prompt experimentation, agent workflow refactoring, and rapid iteration during development cycles.

Tech Stack

Python, LangChain, LangGraph, LangSmith, OpenAI APIs, FAISS, FastAPI, AWS (S3, Lambda, ECS), RAG Architectures, Cursor AI, MCP

Elevance Health: Medical Device Utilization & Predictive Maintenance Optimization Platform Jan 2023- July 2024

Role: Machine Learning Engineer (Data Science)

Project Overview

Built a machine learning–driven platform to predict utilization patterns and maintenance needs of hospital medical devices (e.g., imaging systems, monitoring equipment), enabling optimized scheduling, reduced downtime, and improved asset utilization across healthcare facilities.

Roles & Responsibilities

1. Conducted **EDA and statistical analysis** on high-volume medical device telemetry, usage logs, error codes, and maintenance history covering **12–18 months of operational data** across multiple hospital units.
2. Engineered **time-aware and operational features** such as device runtime, idle cycles, failure intervals, and usage intensity to support predictive modeling of utilization and maintenance needs.
3. Built and validated a **single gradient-boosting ML model** to forecast device utilization and likelihood of maintenance events, improving prediction accuracy by **~18–22% ROC-AUC** over rule-based baselines.
4. Designed **end-to-end ML pipelines** for data preprocessing, training, validation, and model versioning using MLflow, ensuring full reproducibility and auditability.
5. Containerized the ML inference service using Docker and deployed it on **Azure Kubernetes Service (AKS)** to support scalable, near–real-time prediction workloads.
6. Automated infrastructure provisioning and deployment using **Terraform**, aligning with enterprise DevOps and healthcare IT governance standards.
7. Implemented **model performance monitoring and data drift checks**, triggering retraining workflows when prediction accuracy dropped beyond defined thresholds.
8. Partnered with hospital operations and biomedical engineering teams to translate predictions into **maintenance scheduling and asset planning decisions**, reducing unplanned device downtime by **~15%**.

Tech Stack

Python, SQL, Pandas, NumPy, Scikit-learn, XGBoost, MLflow, Docker, Kubernetes (AKS), Terraform, Azure ML, Azure DevOps, Time-Series Feature Engineering

Macy's : Omnichannel Sales Performance & Demand Diagnostics Platform Jan 2021 – Dec 2022

Role: Data Scientist

Project Overview

Built a data analytics platform to diagnose sales performance, demand variability, and operational inefficiencies across physical stores and digital retail channels, enabling data-driven merchandising and supply chain decisions.

Roles & Responsibilities

1. Designed and executed **exploratory data analysis (EDA)** on large-scale sales, returns, and promotions data spanning **50+ retail locations and e-commerce channels**, uncovering demand variability and revenue leakage patterns.
2. Built **cloud-native data pipelines on GCP** to ingest, clean, and unify transactional data from POS systems, online platforms, and inventory feeds into analytics-ready datasets.
3. Developed **derived metrics and KPIs** such as sell-through rate, stock-to-sales ratio, return rate, and channel contribution to support performance diagnostics.
4. Performed **time-based and cohort analysis** to evaluate the impact of promotions, seasonal effects, and store-level performance without applying predictive or ML-based models.
5. Optimized analytical queries in **BigQuery**, reducing dashboard query latency by **~40%** through partitioning, clustering, and efficient SQL design.
6. Created **business-facing dashboards and reports** using Tableau and Plotly to enable merchandising, operations, and leadership teams to track performance and make informed decisions.
7. Partnered with supply chain and merchandising stakeholders to translate analytical insights into **inventory rebalancing and pricing actions**, improving sell-through efficiency by **~10–12%**.

Tech Stack

Python, SQL, Pandas, NumPy, BigQuery, GCP Storage, PySpark, Data Modeling, Statistical Analysis, Tableau, Plotly

American International Group(AIG): Policy & Claims Operations Analytics Platform Jan 2020 – Dec 2020

Role: Associate Data Scientist

Project Overview

Supported insurance operations by building foundational data pipelines, analytical datasets, and reporting solutions for policy administration and claims processing, enabling better visibility into operational performance and risk indicators.

Roles & Responsibilities

1. Ingested and consolidated **policy, claims, and customer datasets** from multiple source systems into AWS S3, handling structured data formats such as CSV and Parquet.
2. Performed **data cleaning, validation, and transformation** using Python (Pandas, NumPy), addressing missing values, inconsistencies, and schema mismatches across datasets.
3. Designed and implemented **ETL pipelines** to prepare analytics-ready tables for downstream reporting and analysis, following enterprise data engineering standards.
4. Wrote optimized **SQL queries** to generate operational metrics including claims volume, settlement turnaround time, policy lapse rates, and loss ratios for business reporting.
5. Conducted **exploratory data analysis (EDA)** to identify trends, seasonal patterns, and anomalies in claims submissions and policy performance across regions and product lines.
6. Built **Power BI dashboards and summary reports** to support underwriting, claims, and operations teams with daily and monthly performance insights.
7. Collaborated with senior data analysts and business stakeholders to document data definitions, assumptions, and reporting logic, ensuring consistency and reusability across teams.

Tech Stack

Python, SQL, Pandas, NumPy, AWS S3, ETL Pipelines, Data Cleaning & Validation, Exploratory Data Analysis, Power BI, GitHub

EDUCATION

Master of Science in Data Science | University of New Haven, Tagliatela College of Engineering – West Haven, CT, USA

Dec 2025 3.75GPA

PROJECTS

VINIMI: AI-Powered Workplace Safety Monitoring System

• Developed a real-time workplace safety compliance system using YOLOv8 (helmet detection) and DeepFace (facial recognition) to automate safety monitoring in construction environments.

• Integrated Qwen Vision-Language Model for natural-language safety queries and built a FastAPI backend with 25+ endpoints for violation detection, worker management, and automated SMS alerts.

• Implemented a video analysis pipeline with a majority-voting algorithm and multi-sample face embedding system for accurate worker identification across camera frames.

Campus Trash Segmentation: Automated Waste Classification System

• Developed a DeepLabV3-ResNet50 semantic segmentation model for pixel-level trash classification, achieving 58.86% mIoU (551% improvement over baseline) using ASPP for multi-scale context modeling.

• Implemented transfer learning from ImageNet and auxiliary loss regularization, achieving 98.34% IoU for background classes and 78.24% IoU for non-recyclable waste classification.

• Conducted systematic hyperparameter optimization and a comprehensive data-augmentation pipeline to address class imbalance in a 193-image campus dataset, reducing test loss by 79.1%.

Airline Sentiment Analysis | University of New Haven

- Analyzed ticket prices and flight delays across major U.S. cities.
- Created insights and visualizations using Python, MS Excel, and Power BI.

Integration of Augmented Reality in Building Information Modelling (BIM)

- Designed 3D building models in Unity3D, overlayed on real-world environments for enhanced walkthroughs.
- Implemented AR-BIM integration for real-time visualization and comparison of plans with completed work.