Rohanraje Bhosale

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Machine Learning Engineer with hands-on experience designing, building, and deploying production-grade ML systems that process large-scale sequence and language data. Proficient in Python, SQL, PyTorch, and Spark, with a strong foundation in building scalable data pipelines and leveraging foundation models (LLMs) for complex NLP tasks. Eager to apply deep analytical skills and experience with end-to-end model development to solve challenging problems in speech recognition and delight millions of users.

Work Experience

Sahyadri Polytechnic Sawarde   June 2022 – January 2024
Assistant Professor (ML & Data Systems Focus)

- Developed and scaled automated systems using Python (Pandas, NumPy) and SQL for grading and plagiarism detection across a 150+ student cohort, improving feedback efficiency by 60%.
- Led 12+ student teams in building and shipping ML-powered projects for hackathons and research expos, focusing on practical application and model performance evaluation.
- Engineered a centralized data tracking system to monitor and analyze student engagement, improving resource allocation for technical workshops by 40%.

Trismus Healthcare Technologies   January 2022 – June 2022
Machine Learning Engineer Intern

- Engineered scalable preprocessing pipelines for large-scale, high-resolution image datasets, reducing training time by 35% and ensuring data compliance for production workflows.
- Designed and evaluated CNN architectures (PyTorch) for classification, translating model performance metrics into actionable business insights for domain experts.
- Built robust quality assurance and data audit tools to maintain dataset integrity and model reproducibility, a critical component for shipping reliable ML products.

Projects

RAG-Powered Conversational AI Portfolio Assistant (ROHbot)   www.rohanraje.com

- Architected a full-stack RAG system using Google Gemini, a Node.js backend, and a Supabase vector database to serve as an interactive AI expert on my portfolio.
- Integrated the ElevenLabs API for real-time custom voice cloning and the Web Speech API for voice input, creating a complete voice-in, voice-out conversational experience.
- Developed the data ingestion and retrieval pipeline, enabling the AI to pull context from a detailed personal knowledge base to provide accurate, context-aware answers.

Agentic AI for Customer Support (Natural Language Understanding System)

- Built a production-ready conversational AI system using Retrieval-Augmented Generation (RAG) and foundation models (GPT-4) to automate 85% of Tier-1 customer queries.
- Engineered custom routing logic and fine-tuned prompts to ground model outputs, cutting resolution time and reducing human escalation rates by 40%.
- Implemented a continuous learning data pipeline to capture user feedback, enabling automated retraining and evaluation of LLM agents to improve contextual understanding over time.

Agentic AI-Driven Market Intelligence (Large-Scale Data Processing)

- Designed a scalable agent framework (LangGraph, LangChain) leveraging **Spark** and cloud services to process and analyze 10K+ documents daily from 200+ real-time data sources.
- Employed RAG pipelines to ground LLM (GPT-4, Claude 3) outputs with real-time external data, achieving 92% accuracy in forecasting market shifts 3–5 weeks in advance.
- Delivered insights through an interactive dashboard connected to a 15TB+ Google BigQuery warehouse, demonstrating experience in handling large-scale data for analytical systems.

ML Framework for Skin Disease Detection (End-to-End Model Development)

- Developed a complete end-to-end R-based ML pipeline for early skin cancer detection, demonstrating proficiency across the entire model lifecycle from preprocessing to performance evaluation.
- Modularized the framework using `caret` and `mlr` to enable plug-and-play integration of new classifiers, improving diagnostic precision by 22% and showcasing skills in building extensible tools.

Education

University of Massachusetts Dartmouth   Dartmouth, MA
Master's in Data Science (Expected)   *January 2026*
Symbiosis International University   MH, India
B.Tech in Computer Science and Engineering   *June 2022*

Technical Skills

Languages:	**Python**, **SQL**, R, MATLAB, JavaScript
ML Frameworks:	**PyTorch**, TensorFlow, Scikit-learn, Hugging Face, LangChain, LangGraph
Large-Scale Data:	**Apache Spark**, AWS (S3, Glue, Lambda, Athena, Redshift), Azure, GCP
Foundation Models:	**OpenAI API (GPT-4)**, Claude, **RAG**, FAISS, Pinecone, Prompt Engineering
Databases & Querying:	PostgreSQL, MySQL, MS SQL Server, MongoDB, Snowflake, Redshift

Publications

Bibliometric Analysis of Machine Learning and Text Mining Algorithms for Diagnosis of Leukemia. (Available on LinkedIn)