Sai Dhiren Musaloji

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Education

New Jersey Institute of Technology - MS in Data Science GPA:3.85/4

Mahatma Gandhi Institute of Technology – B. Tech in ECE GPA: 7/10

Certification

Microsoft Azure Data Science Associate, Microsoft Azure AI Engineer Associate 2022

Technologies

Python, R, SQL, Java, Bash|· scikit-learn, TensorFlow, Keras, PyTorch, XGBoost, MLlib |· Hugging Face, BERT, LSTM, GNN, ARIMA| Pandas, NumPy, Statsmodels, Spark, Hadoop, MapReduce, AWS EMR |· Tableau, Power BI, Jupyter, Matplotlib, Seaborn, Plotly | AWS (EC2, S3, SQS, Rekognition), GCP, Azure |· Docker, Kubernetes, Hadoop, Spark, Oozie, GitHub Actions, CI/CD, MLflow | ·MySQL, PostgreSQL, SQL Server | · ETL pipelines, modular architecture, scalable cloud-native systems |

Experience

AI Engineer Intern - Tech Mahindra, Makers Lab Pune, Maharashtra (Oct 2023 – Jan 2024)

Large Language Model Development

◦ Collaborated with a cross-functional team of AI researchers and engineers to develop **NLP pipelines** for low-resource languages, leveraging **SentencePiece** and dynamic vocabulary switching to handle code-mixed input.

◦ Built ethical AI guardrails with **hybrid regex/neural classifiers** to filter toxic data from **1TB+ conversational** corpus.

◦ Actively contributed to weekly sprint discussions, presented updates to senior architects, and authored internal documentation for reproducibility and deployment.

Projects

Traffic Forecasting Project – Multimodal Ensemble Spatiotemporal Modeling - *(ARIMA, LSTM, GNN, t-SNE, PCA, PEMS-BAY dataset)*

◦ Designed and implemented a **composite forecasting system** integrating **ARIMA, LSTM, and GNN models** to capture both time-based and topological traffic patterns.

◦ Initiated the use of **nonlinear manifold learning (t-SNE, PCA)** to reduce dimensionality of a 325-sensor dataset from PEMS-BAY, resulting in improved model convergence.

◦ Performed critical node selection using graph centrality and **entropy analysis** to balance performance and complexity.

Deep Learning - Advanced Neural Network Architectures - *(PyTorch, GANs, Diffusion Models, BERT, Reinforcement Learning)*

◦ Architected and refined diverse **neural network architectures (DNN/GNN)** for classification and time-series forecasting, skillfully enhancing model accuracy through **hyperparameter tuning and cross-validation**.

◦ Engineered cutting-edge AI systems using **GANs and diffusion models for image synthesis,** leveraging distributed TensorFlow implementations to boost computational efficiency.

◦ Elevated **NLP** and adaptive decision-making capabilities through **BERT fine-tuning** and **reinforcement learning (Policy Gradient/Actor-Critic),** demonstrating proficiency in developing AI systems for complex, real-world applications.

Database Management Web Application - *(Flask, MySQL, HTML/CSS/JS, CI/CD)*

◦ Developed a scalable **Flask-MySQL web application** for **core banking operations** with **real-time transaction handling**.

◦ Integrated an **analytics dashboard** aggregating **transactional data**, **fund flow heatmaps**, and **anomaly detection metrics**- built with scalability targets for containerized **CI/CD deployment**.

AWS SQS Image & Text Recognition Pipeline – Event-Driven Distributed System - *(AWS EC2, SQS, S3, Rekognition, Python, Boto3)*

◦ Implemented a fully decoupled, message-driven **processing pipeline** using **AWS EC2, SQS, S3,** and **Rekognition** for large-scale asynchronous image and text extraction.

◦ Designed independent **stateless compute nodes** for parallel object detection and OCR, communicating via **persistent queueing protocols** to enable **elastic workload scaling**.

◦ Ensured **fault-tolerant orchestration** through visibility timeout tuning, **idempotent state handling**, and **distributed retry logic**, aligning system behavior with **cloud-native architecture** principles.