Venkata Sainath Reddy Pedaballi

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**SUMMARY**

*Dynamic Machine Learning Engineer with expertise in building real-time AI systems, scalable pipelines, and cutting-edge solutions. Skilled in Python, TensorFlow, PyTorch, and Databricks, with experience in chatbots, VR-based fault detection, and IoT tracking devices. Proficient in deploying Generative AI, RAG models, and NLP pipelines, leveraging Docker, Kubernetes, and AWS for seamless, scalable operations. Passionate about driving innovation and delivering impactful AI-driven solutions to solve real-world challenges.*

**Professional Experience**

**ABS Wavesight March 2024-Present**

**Machine Learning Engineer Spring, Texas**

* Deployed real-time chatbots using **Gen AI, BERT**, and **GPT**, reducing average customer response time by 40% and improving overall satisfaction ratings by 30%.
* Designed RAG models with **LLMs**, optimizing decision-making workflows in AI-driven chatbots.
* Developed data pipelines with **Databricks** and **PySpark**, handling large-scale chatbot interaction data.
* Integrated **RESTful APIs** and **gRPC** for seamless communication between chatbots and backend systems.
* Designed a VR-based fault detection system using **OpenCV**, achieving a 90% anomaly detection accuracy in real-time ship part inspections, reducing operational delays by 20%.
* Orchestrated scalable VR workflows using **Docker**, **Kubernetes**, and **AWS Lambda** for high availability.
* Automated image data processing pipelines with **Airflow**, improving fault detection efficiency.
* Mentored junior engineers on AI/ML deployments, **API integrations**, and **CI/CD** automation using **Jenkins** and **Docker**.
* Developed IoT tracking devices with **TinyML** model for location, temperature, and pressure monitoring, using a scalable AWS architecture with API Gateway, **Lambda**, **DynamoDB**, and **Redshift**.
* Implemented distributed pipelines with **Apache Spark** and **Databricks**, optimizing IoT data ingestion and analysis.
* Leveraged **AWS S3** and **Redshift** for secure and scalable IoT data storage and retrieval.
* Developed **Redis** and **Kafka**-driven real-time notifications, improving supply chain anomaly response times by 25%.
* Deployed a multi-region chatbot infrastructure with AWS **ECS**, **Redis**, and **Kafka**, reducing downtime by 30% and improving response speed by 40%.
* Developed Python code for distributed systems, integrating **REST/gRPC** APIs with **PyTest** and **Prometheus** monitoring.
* Optimized tracking accuracy with Python and graph algorithms like **Dijkstra** and BFS for route planning.
* Integrated **Elasticsearch** for real-time log analysis in chatbot and IoT workflows, enabling faster anomaly detection and system debugging.
* Designed secure **OAuth2-based RESTful APIs** for chatbots, VR systems, and IoT device integrations.
* Combined **LangChain**, **OpenCV**, and **Kafka** to enrich workflows for AI-based decision-making applications.
* Automated CI/CD pipelines using **GitHub Actions**, streamlining deployment processes.
* Integrated anomaly detection using **TinyML** and on-device inference, improving IoT security in real-time.
* Enhanced **model versioning and deployment** using **MLflow**, ensuring traceability and reproducibility for AI models.
* Developed **real-time dashboards** using **Grafana** to monitor IoT tracking, chatbot interactions, and VR workflows.
* **Conducted model performance tracking** and **error analysis** using **Prometheus** and **Grafana**, enabling real-time monitoring and reducing latency by 35% and enabling real-time error detection.
* Actively collaborated in **Agile processes**, ensuring cohesive development cycles and delivering high-impact solutions.

**Tools & Technologies:** Python, TensorFlow, PyTorch, Databricks, PySpark, Docker, Kubernetes, Apache Kafka, OpenCV, TinyML, Generative AI, BERT, GPT, PyTest, Redis, Elasticsearch, AWS (S3, Lambda, Redshift), Airflow, RESTful APIs, gRPC, Jenkins, GitHub Actions, MLflow, Grafana.

**Navy Federal Credit Union August 2023 – March 2024**

**Python Developer Vienna, Virginia**

* Developed and maintained responsive web UIs using **React (Hooks, Redux)** and **TypeScript**, **Redux** ensuring efficient state management for real-time financial applications.
* Built and automated unit tests with **JEST** and **React Dev Tools**, optimizing application performance and debugging workflows.
* Engineered scalable backend systems with **Python, Django**, and **Asyncio**, supporting real-time transactions and regulatory compliance.
* Deployed microservices using **Rust, Clojure**, and **gRPC**, enabling low-latency payment gateways and fraud detection.
* Designed secure RESTful APIs with **Django**/**FastAPI**, handling 500K+ daily transactions with **OAuth2** compliance and implemented self-healing APIs in Kafka-driven microservices.
* Deployed **AWS SQS/SNS** for event-driven fraud detection and automated containerized deployments with **Docker**, **Kubernetes**, and **AKS**, ensuring high availability and zero downtime.
* Developed and optimized **ETL pipelines** using **Azure Data Factory** and **Databricks**, transforming large datasets for fraud monitoring.
* Architected and automated **CI/CD** pipelines using GitHub Actions and Jenkins, enabling 40% faster deployments.
* Implemented fraud detection systems using **Spark** and **Databricks**, leveraging **Azure Synapse** for real-time insights.
* Automated real-time **PII detection** using **OCR, Azure Text Classification**, and **NER** models for document redaction and compliance.
* Engineered secure **RESTful APIs** with **OAuth2** for secure authentication, rate-limiting, and real-time API access.
* Processed large-scale streaming data with **Apache Kafka**, enabling real-time alerts for financial transactions.
* Automated backend processes using **Linux Shell Scripting, MySQL**, and **Python**, achieving efficient financial data ingestion.
* Built **RPA workflows** for loan processing and customer onboarding, reducing manual effort with Python automation.
* Enhanced anomaly detection models using **OpenCV**, enabling visual analysis and fault detection in document processing.
* Deployed machine learning pipelines for fraud detection using **TensorFlow, Scikit-Learn**, and **MLOps** for continuous model updates.
* Automated multi-region deployments with **Terraform**, **Jenkins**, and Azure DevOps for zero-downtime releases.
* Created an AI-driven API health monitoring system using Python, **Prometheus**, and **Grafana**, reducing downtime by 25%.
* Developed data models with **ER diagrams, UML**, and **normalization techniques** to maintain consistency in financial transaction data.
* Leveraged **Azure Cosmos DB** and **SQL Databases** for managing high-volume, low-latency financial transactions.
* Created **ETL workflows** with **Azure Data Factory** and **Apache Airflow**, automating real-time model retraining and CI/CD workflows.
* Automated **API and end-to-end testing** using **Postman, PyTest**, and **Selenium**, ensuring smooth deployments and stable applications.
* Orchestrated **multi-region deployments** using **Terraform, Ansible**, and **Azure DevOps**, ensuring high availability for critical banking services.
* Integrated **LangChain** with **Cosmos DB** and **Databricks**, enabling dynamic fraud detection workflows with real-time updates.
* Deployed **Python microservices** using **CI/CD pipelines** and **GitHub Actions**, enforcing code quality with **CodeQL scans**.
* Collaborated in **Agile** development, participating in sprints, code reviews, and pair programming to ensure timely and efficient delivery.

**Tools & Technologies:** Python, React, TypeScript, Django, Asyncio, TensorFlow, PyTorch, Databricks, Docker, Kubernetes, Apache Spark, Apache Kafka, Azure, Terraform, Ansible, Jenkins, GitHub Actions, RESTful APIs, MLOps, Scikit-learn, LangChain, MySQL, PostgreSQL, Selenium, OpenCV.

## **Client: Soulpage IT Solutions July 2021 – August 2022**

**Python Developer Hyderabad, India**

* Developed and managed full-stack applications using **Python, Django, MySQL**, and **PostgreSQL**, prioritizing performance optimization and efficient data handling.
* Automated **ETL** workflows with **Python, Databricks**, and **AWS Lambda**, enabling seamless data synchronization and backend process automation.
* Enhanced frontend interactivity with **CSS** and **Bootstrap**, while integrating **Redis Cache** to speed up data retrieval in high-traffic applications.
* Built and deployed **REST APIs** with **Django** and **Python**, leveraging **AWS EC2** and **RDS** for high availability, scalability, and secure data handling.
* Configured **AWS** (EC2, RDS) with **CloudFormation** and automated deployments with **Ansible** for scalability.
* Implemented real-time data pipelines using **Apache Kafka**, enabling large-scale data streaming and integration with existing analytics systems.
* Developed cross-database integrations for **MySQL** and **Oracle**, automating data extraction and feeding dynamic dashboards with **Django**.
* Configured AWS infrastructure with **CloudFormation** templates, automating deployment of **EC2** and **RDS** instances for seamless scalability.
* Applied **Test-Driven Development (TDD)** for Python and Django projects, using **Pytest** to identify and resolve issues before production.
* Automated **UNIX-**based task processing with **Bash scripting** and Python’s **OS module**, reducing manual interventions and improving task efficiency.
* Used TDD with **Pytest** for Python/Django projects, creating supporting documentation to enhance development consistency.
* Integrated **Redis Cache** with **Django**, optimizing page load times for high-traffic applications and using **AWS Lambda** for backend task processing.
* Utilized **Pandas** for data analysis, creating Python scripts to process, analyze, and visualize large datasets stored in **MySQL**.
* Automated infrastructure tasks with **Ansible**, ensuring consistent deployment and configuration of development, test, and production environments.
* Designed and developed **high-performance web applications** using **Django** and **AWS**, with support for real-time streaming through **Kafka**.
* Implemented **CI/CD pipelines** with **Git**, enabling version control, multi-branch development, and seamless deployments with continuous integration.
* Built scalable backend services with **Django**, leveraging **MySQL** for reliable data storage and **AWS services** for infrastructure support.
* Collaborated in **Agile** development teams, actively participating in sprint planning, daily stand-ups, and iterative development to meet project deadlines.
* Streamlined data workflows by integrating **Apache Kafka** with AWS-backed APIs, ensuring real-time data handling for analytics and reporting.

**Tools & Technologies:**  
Python, Django, MySQL, PostgreSQL, Databricks, AWS Lambda, CSS, Bootstrap, Redis Cache, Apache Kafka, Oracle DB, CloudFormation, AWS EC2, AWS RDS, Pytest, Bash, Ansible, Pandas, Git, CI/CD.

**Academic Projects**

**Stevens Institute of Technology Sept 2023**

**ICU Readmission Prediction Tool**

* Developed a predictive model using Logistic Regression and Random Forest, achieving 76% accuracy, reducing ICU readmissions by 20%, and improving patient care metrics.
* Built a Flask-based web interface, enabling real-time predictions with dynamic user input.
* Applied feature importance analysis, identifying critical health metrics like glucose and BMI for tailored patient care.
* Developed RESTful APIs to integrate frontend predictions with backend logic, ensuring seamless interaction.
* Conducted performance evaluation with precision metrics, iterating to improve sensitivity and specificity.

**Jawaharlal Nehru Technological University Hyderabad Dec 2021**

**Time Series Analysis of Stock Price**

* Built a stock price prediction model using TensorFlow and time series analysis techniques.
* Identified trends and seasonal patterns to enhance predictive accuracy and decision-making.
* Applied hyperparameter tuning and model validation to refine the prediction pipeline.

**A Predictive Model for Customer Churn Using Customer Value May 2022**

* Created a predictive model for telecom customer churn using decision trees and logistic regression.
* Performed feature engineering, identifying high-impact attributes to enhance prediction accuracy.
* Delivered actionable insights for retention strategies by visualizing patterns in customer churn data.

**EDUCATION**

* **Stevens Institute of Technology, School of Systems & Enterprises Sept 2022 - Dec 2023**

Master of Science in Engineering / Industrial Management **Hoboken, NJ**

* **Jawaharlal Nehru Technological University Hyderabad July 2018 – July 2022**

Bachelor’s in computer science and engineering **Hyderabad, India**

**SKILLS**

**Programming Languages:** Python, C, Java, TypeScript, SQL, HTML, CSS  
**Machine Learning & NLP:** TensorFlow, PyTorch, Generative AI, BERT, GPT, TinyML, RAG Models, Scikit-learn, MLOps  
**Frameworks & Libraries:** OpenCV, Databricks, PySpark, LangChain, Flask, Django, React, Jest, Django, Asyncio  
**Data Engineering:** Apache Kafka, Airflow, Redis, AWS Glue, Snowflake  
**Cloud Platforms:** AWS, Azure, Docker, Kubernetes  
**Database Management:** MySQL, PostgreSQL, Cassandra, MongoDB  
**Tools & Automation:** Jenkins, GitHub Actions, Terraform, Ansible, RPA, Postman, PyTest, Selenium  
**Databases:** MySQL, PostgreSQL, MongoDB, Cassandra, Redis  
**API Development:** RESTful APIs, Flask APIs, gRPC, OAuth2, Azure API Management  
**Data Visualization:** Matplotlib, Seaborn, Tableau  
**Version Control & CI/CD:** Git, GitHub, GitLab, Jenkins, GitHub Actions, Azure DevOps  
**System Design:** Real-time Data Pipelines, Distributed Systems, Secure API Architecture  
**Agile Practices:** Sprint Planning, Code Reviews, Pair Programming  
**Scripting & Automation:** Linux Shell Scripting