**Name: ACHYUTHA PRANAVI**

**Role: Senior AI/ML Engineer | Senior Data Analyst**

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**Professional Summary**

* Results-driven **Senior AI/ML Engineer** and **Senior Data Analyst** with **11 years** of experience in **data science**, **machine learning**, **advanced analytics**, **SAS programming**, and **AI solutions** across **finance**, **healthcare**, **retail**, **insurance**, and **telecom** sectors.
* Expert in **cloud-native AI/ML solutions** on **Microsoft Azure** (**Azure ML**, **Databricks**, **Synapse Analytics**, **Cognitive Search**, **Azure OpenAI**) and **AWS** (**Redshift**, **S3**, **Lambda**, **Athena**, **Glue**, **QuickSight**), architecting and deploying **scalable**, **production-ready ML systems**.
* Skilled in **Python**, **TensorFlow**, **PyTorch**, and **cloud-based MLOps workflows** (**AWS SageMaker**, **Azure ML**, **Databricks**) for **developing**, **optimizing**, and **deploying ML/AI models**, including **real-time inference pipelines**.
* Advanced practitioner in **Large Language Models (LLMs)**, **Cursor AI**, and **Generative AI**; built **retrieval-augmented generation (RAG) pipelines** and **localization-focused AI solutions** using **LangChain**, **Semantic Kernel**, **FAISS**, and **Azure Cognitive Search (Azure AI Search)** to enhance accuracy and reduce hallucinations.
* Skilled in optimizing model outputs through fine-tuning, reinforcement learning, and output post-processing for accuracy and relevance.
* Built **multi-agent systems** using **LangChain**, **LangGraph**, **CrewAI**, **AutoGen**, and **Cursor AI** for intelligent automation in **financial research**, **clinical document processing**, and **compliance reporting**.
* Developed **transformer-based NLP models** (**BERT**, **GPT**, **Azure OpenAI**) for **document summarization**, **sentiment analysis**, **entity detection**, and **clinical note processing** in regulated industries.
* Applied **time-series forecasting models** (**ARIMA**, **Prophet**, **LSTM**, **Neural Prophet**) for **financial trend prediction**, **demand forecasting**, and **risk assessment**.
* Designed and deployed **MLOps** and **CI/CD pipelines** using **MLflow**, **Azure DevOps**, **Docker**, and **Kubernetes**, ensuring **reproducibility**, **monitoring**, **governance**, and **compliance** in high-stakes deployments.
* Engineered **feature engineering** and **ETL pipelines** using **PySpark**, **pandas**, **Azure Data Factory**, **AWS Glue**, and **Delta Lake**, delivering enriched datasets to improve model performance.
* Delivered **enterprise analytics** and **business intelligence (BI)** solutions using **Power BI**, **Tableau**, and **QuickSight** for real-time **KPI tracking** and executive reporting.
* Implemented **responsible AI** practices with **SHAP**, **LIME**, **Azure AI Content Safety**, and **fairness metrics** to ensure **transparency**, **explainability**, and compliance (**HIPAA**, **financial regulations**).
* Designed **predictive models** for **fraud detection**, **claims management**, and **patient stratification**, achieving measurable improvements in detection accuracy and operational efficiency.
* Applied **knowledge graph models** with **Neo4j** and **NetworkX** for mapping complex relationships in **fraud detection** and **compliance analytics**.
* Performed **statistical analysis**, **A/B testing**, and **cohort analysis** to drive **targeted marketing**, **campaign optimization**, and **revenue growth**.
* Experienced in advanced AI architecture patterns including **RAG, Agentic RAG, MCP, Functional Calling, and Agent-to-Agent (A2A)** communication within Azure environments, leveraging frameworks like **Spring AI, LangChain, LangGraph, LlamaIndex, and Agno**.
* Developed **high-volume data pipelines** using **Snowflake**, **Alteryx**, and **distributed computing frameworks** for **scalable analytics** in **finance**, **healthcare**, and **retail**.
* Leveraged **self-supervised learning** and **contrastive learning** for **domain-specific pretraining** on **financial** and **healthcare** text corpora, improving **embedding quality** for downstream ML tasks.
* Built **synthetic data generation workflows** with **Gretel.ai** and internal tools to address **class imbalance** while maintaining **privacy** and **compliance**.
* Proven expertise in **SQL query optimization** and **data warehousing** (**Amazon Redshift**, **Snowflake**, **SQL Server**, **MySQL**, **Oracle**) for **near real-time reporting** and **performance gains**.
* Conducted **sales funnel**, **conversion rate**, and **clickstream data analysis** using **Python** (**pandas**, **NumPy**) and **R** to identify **friction points** and growth opportunities.
* Integrated **external datasets** (**Nielsen**, **social media sentiment**, **market data**, **social determinants of health**) with **internal data** to enrich analytical models.
* Implemented **data governance**, **lineage tracking**, and **metadata management** using **AWS Lake Formation**, **Unity Catalog**, and **dbt** for **compliance** and standardization.
* Automated **analytical workflows** using **Python scripting**, **AWS Lambda**, and **Azure Functions**, reducing manual workload and enabling **real-time insights**.
* Experienced in **private equity AI platform** development and integration, leveraging cloud-native architectures with Azure infrastructure, Flask-based API services, and secure microservices design.
* Provided **mentorship** and **cross-functional leadership**, delivering **knowledge-sharing sessions** on **MLOps**, **Generative AI**, **Azure AI Studio**, and translating complex technical outputs into **actionable business insights**.

**Technical Skills**

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| **Programming & Core Technologies** | Python, Java, JavaScript, SQL, SAS, PySpark, Bash, R, Flask, MSSQL, Linux/Unix |
| **Cloud Platforms** | Microsoft Azure (Azure ML, Azure Databricks, Azure Synapse, Azure Cognitive Search (Azure AI Search), Azure OpenAI), AWS (Redshift, S3, Lambda, Athena, Glue, QuickSight), Snowflake |
| **Data Visualization & Business Intelligence** | Power BI, Tableau, QuickSight, Matplotlib, Seaborn |
| **Big Data & ETL** | PySpark, pandas, Azure Data Factory, AWS Glue, SQL, Alteryx, Delta Lake, Apache Airflow |
| **Databases & Data Warehousing** | Amazon Redshift, Snowflake, SQL Server, MySQL, Oracle, Data Modeling, Query Optimization |
| **Statistical Analysis & Business Intelligence** | Advanced Statistics, A/B Testing, Cohort Analysis, Customer Segmentation, Market Research, Business Intelligence, KPI Development, Forecasting & Demand Planning |
| **AI/ML Frameworks & Advanced Learning** | PyTorch, TensorFlow, scikit-learn, Keras, Cursor AI, CrewAI, AutoGen, XGBoost, Databricks,Hugging Face Transformers, LangChain, LangGraph, Semantic Kernel, Self-Supervised Learning, Contrastive Learning, Pretraining (Financial Text), Spring AI, Agno, Pydantic, Prompt Engineering, Context Engineering, Functional Calling, Azure AI Search, Chunking Strategies for RAG Pipelines |
| **NLP & LLMs** | BERT, GPT, Azure OpenAI, RAG (FAISS, Vector DBs), Localization QA, Multi-lingual NLP, Translation Consistency Checks, Text Summarization, Sentiment Analysis, Entity Recognition |
| **Time-Series Forecasting** | ARIMA, Prophet, LSTM, Neural Prophet |
| **Vector & Graph DBs** | FAISS, Azure Cognitive Search (Azure AI Search), Neo4j, NetworkX, Graph Embeddings, Knowledge Graphs |
| **MLOps & DevOps** | MLflow, Azure DevOps, AWS SageMaker, Docker, Kubernetes, Prometheus, Azure Monitor, Azure ML, Databricks, Real-Time Model Inference Pipelines, CI/CD for ML, Unit Testing, Postman |
| **Responsible AI** | SHAP, LIME, Fairness Metrics, Azure AI Content Safety |
| **Synthetic Data & Privacy** | Gretel.ai, Differential Privacy, Data Augmentation |

**Educational Details**

* Master of Science in Computer Science - University of Central Missouri (Aug 2011 - Dec 2012)
* Bachelor of Science in Computer Science - Lovely Professional university (Aug 2007 - Jun 2011)

**Certifications**

* Microsoft Certified: Azure AI Engineer Associate - 2023
* AWS Certified Machine Learning - Specialty – 2021

**Work Experience**

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| Client: Jefferies Financial Group Inc, New York, NY May 2024 - Present |
| Role: Senior AI/ML Engineer Responsibilities: |

* Designed and implemented **AI/ML solutions** on **Microsoft Azure** using **Azure Machine Learning**, **Azure Databricks**, and **Azure Synapse Analytics** for scalable, secure model training, deployment, and governance.
* Led development of **end-to-end ML pipelines** with **Python**, **Azure ML SDK**, and **MLflow**, integrating **CI/CD** and model governance for reproducibility and operational excellence.
* Built and deployed advanced **NLP/LLM models** for **financial document summarization**, **sentiment analysis**, **risk entity detection**, and **localization QA**, leveraging **BERT**, **Azure OpenAI**, and custom **transformer architectures**.
* Architected and delivered **Azure-hosted agentic AI workflows** integrating **Spring AI**, **LangChain**, **LangGraph**, **LlamaIndex**, and **Agno**, with **Pydantic** for schema validation, **functional calling**, and **A2A (Agent-to-Agent)** communication.
* Developed **Java-based microservices** integrated with **AI APIs** and hybrid **Python-Java** solutions for financial analytics pipelines.
* Integrated **vector databases** (**Azure AI Search**, **FAISS**) and applied **embedding & chunking strategies** for optimized **RAG retrieval**, improving context relevance and model output quality.
* Built **multi-agent systems** using **LangChain**, **LangGraph**, **CrewAI**, **AutoGen**, and **Cursor AI** for intelligent automation in **financial research**, **compliance reporting**, and **earnings analysis**.
* Created custom **RAG pipelines** with **grounding**, **context engineering**, and **prompt engineering** to reduce hallucinations and ensure factual accuracy.
* Enhanced **LLM/NLP performance** through **prompt tuning**, **PEFT (parameter-efficient fine-tuning)**, **RLHF**, and post-processing optimizations.
* Implemented **real-time data integration** and **inference pipelines** for high-frequency **financial streams**, reducing latency by 35% and enabling **sub-second decision-making** in trading and **manufacturing-style operational systems**.
* Applied **time-series forecasting models** (**ARIMA**, **Prophet**, **LSTM**) for multi-asset financial trend prediction and risk forecasting.
* Developed **REST APIs** with **Python Flask**, deployed in **Azure**, as part of a **private equity AI core platform**; designed **unit tests** and validated APIs using **Postman** for production readiness.
* Participated in **Agile/Scrum ceremonies** (**Story Elaboration**, **Sprint Planning**, **Daily Standups**, **Retrospectives**) and contributed to backlog grooming and delivery planning.
* Applied **design patterns** (**MVC**, **Singleton**, **Factory**) for scalable, maintainable **AI microservices architecture**.
* Implemented **application security measures** including **encryption**, **SSL/TLS**, **JWT authentication**, and **role-based authorization**.
* Built **LLM-based workflows** for **translation** and **style guide adherence** in collaboration with **linguists** to ensure cultural/contextual accuracy.
* Leveraged **Azure Databricks Delta Lake** and **Unity Catalog** for unified governance, lineage tracking, and secure access to **financial data**.
* Engineered **feature pipelines** using **PySpark**, **pandas**, and **Azure Data Factory** with advanced transformations and temporal joins to improve model performance.
* Applied **knowledge graph modeling** (**Neo4j**, **NetworkX**) to map customer/transaction/instrument relationships for **fraud detection** and **compliance analytics**.
* Integrated **responsible AI tooling** (**Azure AI Content Safety**, **SHAP**, **LIME**) for transparency, fairness, and compliance with financial regulations.
* Created **synthetic data generation workflows** (**Gretel.ai**, custom tools) to augment imbalanced datasets and protect sensitive **financial information**.
* Developed **monitoring dashboards** (**Power BI**, **Azure Application Insights**, **Prometheus**) for tracking drift, accuracy, and anomalies in production.
* Led **self-supervised** and **contrastive learning** research for pretraining on proprietary **financial text corpora**.
* Applied **data mesh** principles for scalable **ML architectures** across global **financial domains**, enabling decentralized innovation.
* Mentored engineers and led internal training on **MLOps**, **generative AI**, **Azure AI Studio**, and **foundation model adaptation**.
* Built **executive reporting suites** in **Power BI** and **Azure Synapse Analytics** to analyze **trading volumes**, **volatility**, and **portfolio performance** for senior leadership.

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| Client: HCA Healthcare Inc, Nashville, TN Nov 2022 - April 2024 |
| Role: AI/ML EngineerResponsibilities: |

* Designed and deployed scalable **machine learning models** to automate risk prediction and patient stratification within healthcare plans, improving proactive care delivery.
* Collaborated with cross-functional healthcare and engineering teams to translate clinical goals into data-driven solutions using **Azure Machine Learning Studio** and **Azure Synapse Analytics**.
* Developed robust **data pipelines** and orchestrated ETL workflows using **Azure Data Factory** to ensure accurate ingestion and transformation of large-scale healthcare data.
* Engineered **predictive models** for claims fraud detection, leading to a 30% reduction in false claims through advanced **supervised learning** techniques.
* Built and maintained **CI/CD pipelines** for ML model deployment using **Azure DevOps**, improving delivery speed and ensuring reproducibility across staging and production environments.
* Utilized **PySpark**, **SQL**, and **Azure Databricks** for distributed data processing and real-time analytics in population health management systems.
* Applied **TensorFlow and PyTorch** to develop deep learning models for classification, anomaly detection, and forecasting in healthcare operations.
* Integrated **SageMaker** endpoints into production workflows for low-latency inference in patient risk stratification models.
* Created explainable AI solutions using **SHAP** and **LIME**, enabling compliance with healthcare regulations and enhancing model transparency for clinicians.
* Integrated external social determinant datasets with HCA data on **Azure Data Lake** to enhance patient outcome modelling through **feature engineering** and **data fusion**.
* Implemented **model monitoring dashboards** using **Power BI** and **Azure Monitor**, allowing continuous tracking of ML performance and drift in real-world settings.
* Conducted **hyperparameter tuning** and **model optimization** leveraging **Azure AutoML** for accelerated experimentation and model selection.
* Ensured all AI solutions complied with **HIPAA** standards, embedding privacy, security, and governance controls into the ML lifecycle.
* Supported the development of **NLP models** to analyze unstructured clinical notes, enabling structured data extraction and classification via **BERT** and **spaCy** frameworks.
* Led efforts in **data labelling strategies**, annotation workflows, and **active learning**, accelerating model training for medical image and document classification.
* Participated in design reviews and code audits to enforce **MLOps best practices**, including containerization using **Docker** and orchestration with **Kubernetes on Azure AKS**.
* Explored early agentic designs using LangChain and **Cursor AI** for automating clinical document parsing, note classification, and physician Q&A support.
* Collaborated with stakeholders to define key metrics and success criteria for AI initiatives, aligning ML outputs with the goals of value-based healthcare.
* Developed anomaly detection and forecasting models to optimize operational workflows in healthcare facilities, applying methodologies transferable to manufacturing production line optimization.
* Integrated deployed models into scalable cloud pipelines for continuous monitoring and retraining, ensuring sustained performance in dynamic, high-volume environments.
* Applied **transfer learning** and **deep learning** models to diagnostic imaging use cases, improving anomaly detection accuracy across large datasets.
* Mentored junior engineers and data scientists on **Azure ML workflows**, code versioning using **Git**, and experiment tracking with **MLflow**.
* Delivered impactful presentations to both technical and non-technical audiences, demonstrating the business value and clinical implications of AI projects.

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| Client: Target Corp, Minneapolis, MN Jan 2019 - Oct 2022 |
| Role: Senior Data Analyst Responsibilities: |

* Led the design and implementation of scalable **data pipelines on AWS**, utilizing **Amazon Redshift**, **S3**, and **AWS Glue**, to process and store high-volume retail transaction data.
* Delivered actionable insights by developing complex **SQL queries** and **stored procedures** to analyze customer behavior, product trends, and seasonal performance across Target's retail network of 1,800+ locations.
* Created dashboards using **Tableau, Power BI, and Amazon QuickSight** for real-time executive reporting on inventory optimization, supply chain efficiency, and retail KPIs, integrating with **Athena and Glue Data Catalog** for seamless data querying and exploration.
* Collaborated with cross-functional teams including marketing, merchandising, and e-commerce to align business goals with data strategies, improving campaign targeting by 23%.
* Executed deep-dive analysis on sales funnels, conversion rates, and clickstream data using **Python (pandas, NumPy)** to identify friction points in the customer journey.
* Managed the end-to-end lifecycle of data modeling projects, ensuring consistency across dimensions and metrics using **dbt** and **Snowflake**, enhancing data integrity across teams.
* Designed and optimized ETL workflows using **Alteryx** to automate ingestion and transformation of financial data.
* Used **SAS** to build high-volume retail analytics reports integrating AWS Redshift data, improving reporting speed by 35%.
* Leveraged **Snowflake** for scalable data warehousing, supporting RAG pipelines and model-ready datasets for LLMs.
* Applied advanced **statistical methods and regression models** to predict demand fluctuations and optimize pricing strategies, contributing to a 12% revenue uplift in 2021.
* Automated recurring reporting processes with **Python scripting and AWS Lambda**, reducing manual workload by 40% and improving delivery accuracy.
* Led data governance initiatives, including **data quality checks**, lineage documentation, and access control using **AWS Lake Formation**, ensuring compliance with internal and regulatory standards.
* Integrated external market datasets (e.g., Nielsen, social media sentiment) to enrich internal datasets and support **competitive analysis** and localized merchandising efforts.
* Developed forecasting models using **Prophet and ARIMA** to assist in inventory planning and reduce overstock scenarios across warehouse hubs.
* Delivered training sessions and onboarding guides for junior analysts on **AWS tools**, data interpretation, and visualization best practices.
* Collaborated with DevOps to integrate data monitoring solutions using **CloudWatch**, improving system reliability and proactive issue detection.
* Conducted cohort and churn analysis using **SQL and Python**, identifying high-value customer segments and helping marketing focus on retention campaigns.
* Implemented best practices in version control, CI/CD pipelines, and analytics code management using **Git, AWS CodeCommit**, and **Jenkins**.
* Conducted statistical significance testing and confidence interval analysis for **A/B tests**, ensuring robust decision-making for marketing campaigns and product features across digital and in-store experiences.
* Built executive-level financial reporting dashboards tracking revenue metrics, profit margins, and ROI across business units, providing real-time insights for C-suite strategic planning and quarterly board presentations.
* Acted as a key liaison between business stakeholders and technical teams, translating analytical findings into business decisions that directly impacted revenue, customer engagement, and operational efficiency.

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| Client: Allstate, Northbrook, IL Sept 2015 - Dec 2018 |
| Role: Data Analyst Responsibilities: |

* Conducted comprehensive data analysis on policyholder behavior, claim trends, and underwriting data to support strategic insurance pricing decisions and risk assessments.
* Utilized **AWS services (S3, Redshift, Athena, and Glue)** to manage and process large insurance data sets securely and efficiently within a cloud-based infrastructure.
* Developed and maintained **interactive dashboards using Tableau and Power BI** to track KPIs, claim volumes, and customer retention trends, increasing stakeholder visibility into performance metrics.
* Designed and implemented **ETL pipelines** leveraging **AWS Glue and Python** to automate data ingestion from multiple sources including internal CRM and third-party actuarial datasets.
* Collaborated with actuarial and underwriting teams to perform predictive modeling using **Python (pandas, scikit-learn)** for churn prediction and fraud detection in claims processing.
* Optimized SQL queries on **Amazon Redshift** to deliver near real-time reporting and improved system performance by 30% in monthly executive reporting.
* Participated in data governance initiatives to ensure **data quality, accuracy, and compliance with insurance regulations** including HIPAA and state-level privacy laws.
* Conducted detailed cohort analyses to identify customer behavior patterns and delivered actionable insights that directly improved cross-sell campaign effectiveness.
* Led efforts in integrating and standardizing structured and unstructured data across policy, claims, and customer interaction channels, using **Python and AWS Lambda** functions.
* Applied advanced statistical methods and **machine learning techniques** to support pricing optimization and dynamic segmentation of customers.
* Coordinated with business stakeholders to gather requirements and translate them into analytical models and visual solutions that directly influenced operational decisions.
* Created data dictionaries and maintained metadata repositories to ensure **data transparency and traceability** across functional teams and tools.
* Provided ad hoc reporting and strategic insights to support sales, marketing, and claims departments in aligning performance with business goals.
* Implemented data anomaly detection scripts in **Python and SQL** to flag outliers in claim submissions, improving fraud detection by 18%.
* Collaborated with DevOps and cloud engineering teams to ensure **secure and scalable deployment of analytics workflows using AWS IAM, EC2, and CloudWatch**.
* Developed actuarial pricing models using statistical regression techniques and risk assessment algorithms, supporting underwriting decisions and contributing to optimized premium pricing strategies across multiple insurance product lines.
* Regularly evaluated new market analytics tools and insurance industry trends to enhance analytical capabilities and align with evolving data science practices.

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| Client: Ooma Inc, Sunnyvale, CA Feb 2013 - Aug 2015 |
| Role: Data Analyst Responsibilities: |

* Collaborated with cross-functional teams to **analyze large-scale telecom data**, improving decision-making processes and increasing operational efficiency by over 20%.
* Developed and maintained **automated dashboards and visual reports** using **Tableau and Power BI**, enabling senior leadership to monitor KPIs in real-time.
* Executed end-to-end data analysis projects by extracting data from **SQL databases**, transforming it through **ETL pipelines**, and performing statistical evaluation.
* Conducted deep analysis on customer behavior and churn patterns using **Python (pandas, NumPy)** and **R**, leading to actionable retention strategies.
* Worked closely with engineering and marketing teams to align data findings with **telecom industry trends**, enhancing product targeting and customer segmentation.
* Implemented **data validation and cleansing routines** to ensure data integrity and consistency across systems, improving report accuracy by 30%.
* Led efforts in **market segmentation analysis**, providing insight into user demographics and usage patterns which supported strategic pricing initiatives.
* Created predictive models using **machine learning techniques** to forecast call drop rates and optimize network resource allocation.
* Processed large datasets using **SQL Server** and **MySQL**, optimizing queries for analytical performance.
* Worked with **Oracle databases** and basic **ETL processes** to support telecom analytics.
* Assisted in migration projects by validating datasets post-transfer, ensuring smooth transition and compliance with industry standards.
* Supported monthly and quarterly business reviews with **trend analysis**, highlighting growth opportunities and operational inefficiencies in telecom services.
* Developed A/B testing frameworks to assess the impact of new telecom features, helping guide product development with data-driven insights.
* Provided stakeholder training on interpreting data reports and visualizations, promoting a **data-driven culture** across departments.
* Analyzed **call quality and VoIP metrics**, identifying bottlenecks and recommending improvements that enhanced service reliability and customer satisfaction.
* Maintained documentation for data models, processes, and business logic to ensure transparency and enable future scalability.