**Name: ACHYUTHA PRANAVI K**

**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**, delivering measurable business impact through cutting-edge implementations.
* 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**), **GCP (BigQuery, Vertex AI, Dataflow),** architecting and deploying **scalable, production-ready ML/AI systems**.
* Skilled in **Python, TensorFlow, PyTorch, R, SQL, 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), Generative AI, Cursor AI, and Agentic Workflows**, building **retrieval-augmented generation (RAG) pipelines** and **localization-focused AI solutions** using **LangChain, Semantic Kernel, FAISS, Azure Cognitive Search, LlamaIndex, Spring AI, and Agno**, enhancing accuracy and reducing hallucinations.
* Specialized in building **Agentic AI systems** where LLM-powered agents autonomously plan, execute, and validate complex workflows across finance and healthcare domains.
* Earlier at HCA Healthcare, I pioneered **agentic AI prototypes** for compliance Q&A and claims fraud detection, laying the groundwork for multi-agent healthcare automation.
* Experienced in **advanced AI architecture patterns** including **RAG, Agentic RAG, MCP (Model Context Protocol), Function Calling, and Agent-to-Agent (A2A) communication** within **Azure environments**.
* Developed **transformer-based NLP models** (**BERT, GPT, Azure OpenAI**) for **document summarization, sentiment analysis, entity/risk detection, and clinical note processing**, enabling **automated compliance and research workflows**.
* Skilled in **fine-tuning, reinforcement learning (RLHF), prompt-tuning, and post-processing** to improve model alignment, accuracy, and relevance.
* Designed and deployed **multi-agent systems** using **LangChain, LangGraph, CrewAI, AutoGen, and Cursor AI** for **intelligent automation in finance, healthcare, and compliance reporting**.
* Applied **time-series forecasting models** (**ARIMA, Prophet, LSTM, Neural Prophet**) for **financial trend prediction, demand forecasting, and risk assessment** in lending, trading, and retail operations.
* Built comprehensive **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** with **PySpark, pandas, Azure Data Factory, AWS Glue, Delta Lake, and Alteryx**, delivering **high-quality datasets** that significantly improved model performance.
* Delivered **enterprise analytics and BI solutions** using **Power BI, Tableau, and QuickSight** for **real-time KPI tracking and executive reporting** across multiple industries.
* Implemented **responsible AI practices** with **SHAP, LIME, fairness metrics, and Azure AI Content Safety**, ensuring **explainability, transparency, and regulatory compliance (HIPAA, financial services)**.
* Designed **predictive models** for **fraud detection, claims management, and patient stratification**, achieving **30% reduction in false claims** and **18% improvement in fraud detection accuracy**.
* Applied **knowledge graph models** with **Neo4j, NetworkX, and graph embeddings** to map **complex relationships in fraud detection and compliance analytics**.
* Conducted **advanced statistical analysis, A/B testing, cohort analysis, and segmentation**, contributing to **23% campaign targeting improvement** and **12% revenue uplift**.
* Built **scalable data pipelines** processing **financial transactions, healthcare records, and retail data** using **Snowflake, Alteryx, and distributed computing frameworks**.
* Leveraged **self-supervised learning and contrastive learning** for **domain-specific pretraining** on financial and healthcare text corpora, improving **embedding quality** for downstream ML tasks.
* Developed **synthetic data generation workflows** with **Gretel.ai** and internal tools to address **imbalanced datasets** while ensuring **privacy, security, and compliance**.
* Proven expertise in **SQL query optimization and data warehousing** using **Amazon Redshift, Snowflake, SQL Server, MySQL, Oracle**, delivering **near real-time reporting** and **30% system performance improvements**.
* Conducted **sales funnel, conversion rate, and clickstream data analysis** using **Python (pandas, NumPy) and R**, identifying **growth opportunities across 1,800+ retail locations**.
* Integrated **external datasets** (e.g., **Nielsen, social media sentiment, market data, social determinants of health**) with internal data for **enriched analytical models and competitive insights**.
* Implemented **data governance, lineage tracking, and metadata management** using **AWS Lake Formation, Unity Catalog, and dbt**, ensuring **standardization and regulatory compliance**.
* Automated **analytical workflows** with **Python scripting, AWS Lambda, and Azure Functions**, reducing **manual workload by 40%** and enabling **real-time insights**.
* Experienced in **private equity AI platform development and integration**, leveraging **Azure infrastructure, Flask-based API services, and secure microservices design**.
* Delivered **cross-functional leadership and mentorship**, conducting **knowledge-sharing sessions** on **MLOps, Generative AI, Azure AI Studio**, and translating **complex AI models into actionable business insights**.

**Technical Skills**

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| **Programming & Core Technologies** | Python, Java, JavaScript, SQL, SAS, PySpark, Bash, R, Flask, Pydantic, MSSQL, Linux/Unix |
| **Cloud Platforms** | Microsoft Azure (Azure ML, Azure Databricks, Azure Synapse, Azure Cognitive Search / Azure AI Search, Azure OpenAI, Azure ML Studio),AWS (SageMaker, Redshift, S3, Lambda, Athena, Glue, QuickSight), GCP (BigQuery, Vertex AI, Dataflow, Looker Studio), Snowflake, Databricks |
| **Data Visualization & BI** | Power BI, Tableau, Amazon QuickSight, Matplotlib, Seaborn |
| **Big Data & ETL** | PySpark, pandas, Azure Data Factory, AWS Glue, SQL, Alteryx, Delta Lake, Apache Airflow |
| **Databases & 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, KPI Development, Forecasting & Demand Planning |
| **AI/ML Frameworks & Agentic AI & Advanced Learning** | PyTorch, TensorFlow, scikit-learn, Keras, XGBoost, Hugging Face TransformersAgentic AI (Core Expertise): LangChain, LangGraph, CrewAI, AutoGen, Cursor AI, Semantic Kernel, Spring AI, AgnoAgentic AI Concepts: Multi-Agent Systems, A2A Communication, Function Calling, Model Context Protocol (MCP), Planner–Executor WorkflowsSelf-Supervised & Contrastive Learning, Prompt/Context Engineering, RAG Pipelines |
| **NLP & LLMs** | BERT, GPT, Azure OpenAI, RAG (FAISS, Vector DBs), Text Summarization, Sentiment Analysis, Entity Recognition, Localization QA, Multi-lingual NLP, Translation Consistency Checks |
| **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, Azure ML, Databricks, Docker, Kubernetes, Prometheus, Azure Monitor, CI/CD for ML, Real-Time Model Inference Pipelines, 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 ML, Azure Databricks, and Azure Synapse Analytics** for scalable, secure model training, deployment, and governance.
* Led **end-to-end ML pipeline development** with **Python, Azure ML SDK, and MLflow**, integrating **CI/CD** and governance for reproducibility and operational excellence.
* Built and deployed **NLP/LLM models** for **financial document summarization, sentiment analysis, risk entity detection, and localization QA**, leveraging **BERT, GPT, Azure OpenAI**, and custom transformers.
* **Designed Agentic AI workflows** that coordinated multiple autonomous agents (retriever, summarizer, validator) using **LangChain, LangGraph, CrewAI**, **LlamaIndex, Spring AI, Agno, Cursor AI** and **AutoGen -** enabling **end-to-end financial research automation** with minimal human oversight.
* **Built multi-agent systems** for compliance and earnings analysis, where agents collaborated to extract insights, validate against rules, and generate executive-ready reports — **cutting manual analyst workload by 65% and reducing errors by 30%**.
* Implemented **Agent-to-Agent (A2A) communication and function-calling orchestration**, allowing LLM-powered agents to trigger APIs, query databases, and cross-verify outputs in real time for **audit-proof financial reporting**.
* Developed **RAG pipelines** with **FAISS, Azure Cognitive Search (AI Search)**, applying **embedding, chunking, grounding, prompt engineering, and context engineering strategies** to reduce hallucinations and improve retrieval accuracy.
* Evaluated **GCP Vertex AI and BigQuery** alongside Azure ML to benchmark RAG pipeline portability and performance for financial document summarization, ensuring multi-cloud flexibility and cost optimization.
* Enhanced **LLM/NLP performance** through **prompt tuning, PEFT (parameter-efficient fine-tuning), RLHF, and post-processing optimizations**.
* Applied **time-series forecasting models** (**ARIMA, Prophet, LSTM**) for **multi-asset financial trend prediction and risk forecasting** in lending and trading use cases.
* Engineered **feature pipelines** using **PySpark, pandas, Azure Data Factory, and Databricks Delta Lake**, enabling **advanced transformations and temporal joins**.
* Applied **knowledge graph modeling (Neo4j, NetworkX)** to map customer–transaction–instrument relationships for **fraud detection and compliance analytics**.
* Developed **REST APIs (Flask, Python)** and **hybrid Python-Java microservices** integrated with AI APIs for financial analytics; validated using **unit tests & Postman**.
* Applied **design patterns (MVC, Singleton, Factory)** for scalable AI microservices and enforced **application security** (SSL/TLS, JWT, RBAC).
* Implemented **real-time inference pipelines** for high-frequency financial streams, reducing latency by **35%** and enabling **sub-second decision-making**.
* Built **synthetic data generation workflows** with **Gretel.ai and internal tools** to augment imbalanced datasets while protecting sensitive financial data.
* Created **monitoring dashboards** with **Power BI, Azure Application Insights, Prometheus** to track **model drift, prediction accuracy, and anomalies**.
* Researched **self-supervised and contrastive learning** for pretraining on proprietary financial corpora to improve domain embeddings.
* Applied **data mesh principles** for scalable ML architectures across **global financial domains**, enabling decentralized innovation.
* Integrated **Responsible AI practices** with **SHAP, LIME, and Azure AI Content Safety** to ensure transparency, fairness, and compliance with financial regulations.
* Participated in **Agile/Scrum ceremonies** (Planning, Standups, Retrospectives), collaborating across engineering, compliance, and trading teams.
* Created **executive reporting suites** in **Power BI and Azure Synapse Analytics**, delivering real-time insights on **trading volumes, market volatility, and portfolio performance**.
* Mentored engineers and analysts, leading **training on MLOps, Generative AI, Azure AI Studio, and foundation model adaptation**, establishing best practices for **production-scale AI in finance**.

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

* Designed and deployed **ML models for patient risk prediction and stratification**, improving proactive care delivery and clinical decision support.
* Partnered with **clinical and engineering teams** to translate healthcare goals into **data-driven ML solutions** using **Azure Machine Learning Studio, Azure Synapse Analytics, and Azure Databricks**.
* Built **ETL/data pipelines** with **Azure Data Factory, PySpark, and SQL**, ensuring accurate ingestion and transformation of **large-scale healthcare datasets**.
* Developed **fraud detection models** for claims, achieving a **30% reduction in false claims** using supervised ML.
* Created **deep learning models** with **TensorFlow and PyTorch** for **classification, anomaly detection, and time-series forecasting** in healthcare operations.
* Integrated **explainable AI (SHAP, LIME)** to ensure transparency, compliance, and clinician adoption in predictive models.
* **Prototyped early Agentic AI workflows** by combining LangChain, Azure OpenAI, and Azure Cognitive Search to create **autonomous clinical Q&A assistants** that retrieved compliance documents, answered physician queries, and flagged missing information.
* Designed **multi-agent validation flows** where one agent extracted patient data, another verified clinical coding accuracy, and a third checked HIPAA compliance — **reducing audit preparation time by 40%**.
* Integrated **RAG + agent-based orchestration** to build intelligent assistants for claims fraud detection and medical note summarization, enabling **self-checking workflows** that improved accuracy and trust in clinical decision support systems.
* Leveraged **Azure AutoML** for hyperparameter tuning and accelerated model experimentation.
* Leveraged **GCP Dataflow** for real-time ingestion of clinical data streams in a POC, comparing performance and cost efficiency against Azure Data Factory.
* Implemented **MLOps pipelines** using **Azure DevOps, MLflow, Docker, and Kubernetes (AKS)** for reproducible and scalable deployments.
* Developed **monitoring dashboards** with **Power BI and Azure Monitor** for drift detection, accuracy tracking, and compliance reporting.
* Integrated **social determinants of health (SDoH)** datasets with internal records on **Azure Data Lake**, enhancing predictive models through feature engineering.
* Applied **transfer learning** to diagnostic imaging use cases, improving anomaly detection accuracy across medical scans.
* Supported **annotation workflows and active learning** for medical imaging and text datasets, reducing labeling overhead.
* Contributed to **data privacy & HIPAA compliance**, embedding security and governance controls across the ML lifecycle.
* Mentored junior engineers on **Azure ML workflows, Git version control, and MLflow tracking**.
* Delivered **presentations to clinicians and leadership**, demonstrating AI’s role in **value-based care** and operational efficiency.

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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 AWS data pipelines** using **Amazon Redshift, S3, Glue, and Athena** to process and store **high-volume retail transaction data** across 1,800+ locations.
* Delivered **actionable insights** with **complex SQL queries, stored procedures, and SAS reports**, improving reporting speed by **35%** and enabling deeper customer behavior and product trend analysis.
* Created **executive dashboards** in **Power BI, Tableau, and Amazon QuickSight**, providing **real-time visibility** into **inventory optimization, supply chain efficiency, and sales KPIs**.
* Collaborated with **marketing, merchandising, and e-commerce teams** to align analytics with business goals, improving **campaign targeting by 23%**.
* Conducted **sales funnel, conversion rate, and clickstream analysis** using **Python (pandas, NumPy)**, identifying friction points in the customer journey.
* Managed **data modeling projects** with **dbt and Snowflake**, ensuring consistency in dimensions/metrics and strengthening data integrity across teams.
* Designed **ETL workflows** in **Alteryx** to automate ingestion and transformation of financial and operational data.
* Leveraged **Snowflake data warehousing** to prepare **model-ready datasets**, laying groundwork for **future RAG/LLM use cases** in retail knowledge bases.
* Integrated **GCP BigQuery** in a hybrid retail analytics workflow to process promotional campaign data, later migrated insights into AWS Redshift for enterprise reporting.
* Applied **advanced statistical models** and **demand forecasting (Prophet, ARIMA, regression models)**, contributing to a **12% revenue uplift in 2021** through optimized pricing and inventory.
* Automated recurring reporting with **Python scripting and AWS Lambda**, reducing manual workload by **40%** and improving accuracy.
* Led **data governance initiatives** with **AWS Lake Formation**, implementing **data quality checks, lineage tracking, and access controls** to meet compliance standards.
* Integrated **external datasets** (Nielsen, social media sentiment, market data) with internal sources, enriching analytics for **competitive intelligence and localized merchandising**.
* Partnered with DevOps to deploy **monitoring solutions via CloudWatch**, improving reliability and proactive issue detection.
* Conducted **churn and cohort analysis** with SQL and Python, helping identify high-value customers and shaping retention strategies.
* Implemented **CI/CD pipelines and version control** with **Git, AWS CodeCommit, and Jenkins** for analytics and reporting workflows.
* Performed **A/B testing, statistical significance testing, and confidence interval analysis**, enabling **data-backed marketing and product feature decisions**.
* Built **executive-level financial reporting dashboards** for C-suite, tracking **revenue, margins, ROI**, and supporting **quarterly board reviews**.
* Acted as a **liaison between business stakeholders and technical teams**, ensuring analytical findings were translated into **strategic business outcomes**.
* Delivered **training sessions** for junior analysts on **AWS tools, SQL, visualization best practices**, fostering a data-driven culture.

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

* Conducted **data analysis on policyholder behavior, claims trends, and underwriting data**, supporting **insurance pricing and risk assessments**.
* Leveraged **AWS services (S3, Redshift, Athena, Glue)** for large-scale insurance data processing in a secure cloud environment.
* Built and maintained **dashboards in Tableau, Power BI, and SAS Visual Analytics**, improving visibility into KPIs, claim volumes, and customer retention.
* Designed **ETL pipelines** using **AWS Glue, SQL, and Python**, automating ingestion from **CRM systems and actuarial datasets**.
* Collaborated with actuaries to develop **predictive models in SAS and Python (pandas, scikit-learn)** for **churn prediction and fraud detection**, reducing fraud by **18%**.
* Utilized **SAS statistical procedures (PROC REG, PROC LOGISTIC, PROC GLM)** to support actuarial pricing models and dynamic customer segmentation.
* Optimized **SQL queries in Redshift** to improve reporting performance by **30%** and deliver near real-time insights.
* Conducted **cohort analysis and customer segmentation** with SAS and SQL, directly improving cross-sell campaign effectiveness.
* Standardized **structured & unstructured data integration** across policy, claims, and customer interaction systems using **AWS Lambda + Python**.
* Participated in **data governance initiatives**, ensuring HIPAA and regulatory compliance with **SAS data quality checks and metadata management**.
* Applied **statistical anomaly detection** in **SAS and SQL** to flag unusual claim submissions.
* Partnered with DevOps for secure deployment of analytics workflows using **AWS IAM, EC2, and CloudWatch**.
* Delivered **ad hoc SAS/SQL reports** to support sales, marketing, and claims leadership in aligning business goals with analytics.
* Maintained **data dictionaries & metadata repositories** for transparency and cross-team usage.
* Regularly evaluated **new BI and ML tools**, helping Allstate evolve from **SAS-heavy workflows to cloud-native Python/AWS analytics**.
* Provided **training on SAS, SQL, and Tableau** for junior analysts, strengthening enterprise adoption of analytics practices.

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

* Partnered with **engineering, operations, and marketing teams** to analyze **large-scale telecom datasets**, improving operational efficiency by **20%+**.
* Built and maintained **dashboards and reports in Tableau and Power BI**, providing executives with real-time visibility into **call quality, churn, and customer KPIs**.
* Executed **end-to-end data analysis projects**: data extraction (SQL Server, Oracle, MySQL), ETL transformations, and statistical evaluations.
* Conducted **churn and customer behavior analysis** using **Python (pandas, NumPy) and R**, leading to data-driven retention and loyalty strategies.
* Developed **predictive models** (logistic regression, decision trees) to **forecast call drop rates and optimize network resource allocation**, improving service quality.
* Implemented **data validation and cleansing routines**, improving reporting accuracy and consistency by **30%**.
* Performed **market segmentation analysis**, uncovering key demographics and usage trends to support **pricing and customer acquisition strategies**.
* Supported **telecom feature experimentation** by designing **A/B testing frameworks** and analyzing product adoption outcomes.
* Conducted **VoIP/call quality analytics**, identifying network bottlenecks and recommending improvements that enhanced **service reliability and customer satisfaction**.
* Designed **ETL pipelines** for structured/unstructured data to standardize telecom analytics workflows.
* Assisted with **database migration projects**, validating data integrity and ensuring compliance with industry standards.
* Produced **trend analyses for monthly/quarterly business reviews**, highlighting growth opportunities and operational risks.
* Delivered **training sessions** to stakeholders on interpreting BI dashboards and reports, fostering a **data-driven culture** across the company.
* Maintained **documentation of data models, processes, and business logic**, ensuring scalability and knowledge transfer across teams.