# Vigneshwari Jayaprakash

vjayapr1@asu.edu • 505-550-9282 • LinkedIn • Github • Portfolio

**Data Scientist | Statistical Modeling | ML & Decision Systems | RAG, Anomaly Detection | $1M+ Impact**

## Education

**Arizona State University** — Tempe, AZ
*Master of Science in Data Science (Computing and Decision Analytics) – GPA: 4.0/4.0* — *Expected May 2026*

**Anna University** — India
*Bachelor of Technology in Information Technology – GPA: 3.6/4.0* — *2009 – 2013*

## Core Expertise

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|---|---|
| **Languages & Data** | Python, SQL, R, PostgreSQL, Elasticsearch |
| **ML & AI Frameworks** | scikit-learn, XGBoost, PyTorch, TensorFlow, LangChain, Transformers |
| **Generative AI & LLMs** | RAG Systems, Vector Embeddings, Prompt Engineering, LLM Fine-tuning |
| **Data Engineering** | Pandas, NumPy, ETL Pipelines, Apache Spark, Data Validation |
| **Experimentation & Stats** | A/B Testing, Hypothesis Testing, Feature Engineering, Statistical Modeling |
| **Visualization & Tools** | Tableau, Power BI, Git, Docker, REST APIs |

## Professional Experience

**New Mexico Department of Information Technology**
*Data Scientist — Machine Learning & Analytics* — *Jun 2025 – Dec 2025*

- Architected **GenAI conversational analytics system (LLM + RAG)** processing 10K+ cybersecurity incidents, reducing incident intelligence retrieval time from hours to seconds.
- Deployed **ensemble anomaly detection models** achieving 85% threat detection accuracy while reducing false positives by **60%**.
- Streamlined **real-time ETL pipelines** with automated validation, improving data quality by 40% and reducing manual effort by **30%**.

**Infosys Ltd — Client: BNSF Railway**
*Technology Analyst & Senior Software Engineer (Data & Analytics)* — *Oct 2013 – Jan 2019*

- Developed **ML-powered fraud detection system** with ensemble modeling (XGBoost + Random Forest), processing 1M+ transactions daily and delivering **$1M+ annual cost savings**.
- Designed **predictive maintenance models** for transportation assets, reducing unplanned downtime by 25% through early failure detection across 500+ locomotives.
- Orchestrated **distributed ETL framework** handling 5TB+ daily data ingestion with 99.9% uptime, supporting real-time analytics for operational decision-making.
- Presented analytical findings to technical and non-technical stakeholders.

## Projects

**AI-Powered Railway Track Defect Detection System** *(Python, PyTorch, YOLO, OpenCV)*

Automated visual inspection system to reduce manual railway safety review.

- Constructed **computer vision pipeline** processing 500+ hours of track footage to detect safety-critical defects with **92% accuracy**.
- Minimized manual video inspection effort by **40%** using intelligent flagging workflow that surfaces only high-risk segments.

**Transaction Risk Scoring and Fraud Detection Platform** *(Python, XGBoost, scikit-learn, SHAP)*

Behavioral transaction monitoring system for fraud detection under extreme class imbalance.

- Synthesized **time-series behavioral features** from 300K+ transactions capturing user spending patterns, velocity, and deviation metrics.
- Launched **production scoring API** processing 10K+ daily transactions with sub-200ms latency for real-time decision support.

**Dynamic Pricing & Offer Optimization Engine** *(Python, Contextual Bandits, Feature Engineering)*

Learning-based pricing and offer selection system to adapt decisions per user context.

- Implemented **contextual multi-armed bandit algorithm** with Thompson sampling to optimize offer selection across 15 user segments.
- Achieved **130% conversion lift** over rule-based baseline through continuous learning from 50K+ user interactions.
- Established **A/B testing infrastructure** enabling controlled rollout and performance monitoring across user cohorts.

## Awards & Recognition

**Gold Medalist (UG)** | **ASU Scholar** | **BNSF Railway CFO Recognition** ($1M+ savings via fraud detection) | **Instant Award** (legacy system modernization)