Akarshan Rasyal

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Summary

MSc Data Science graduate specialising in Python, SQL, machine learning and AI. Passionate about solving real-world problems through data, with experience building end-to-end solutions across customer intelligence, forecasting, NLP and computer vision.

Won HackerRank SQL (Advanced) Certification - Link

Want to know more? Ask my AI-Chatbot powered Portfolio: (akarshan.co.uk)

Key Skills

Programming & Data: Python, SQL, Pandas, NumPy, SciPy, Matplotlib, Seaborn
Machine Learning & Statistics: Scikit-learn, LightGBM, XGBoost, Random Forest, Gradient Boosting, Regression, Classification, Clustering, Time-Series Forecasting, Feature Engineering, Hyperparameter Tuning, SHAP, Model Evaluation, Data Quality, Drift Detection
AI & NLP: LLMs, RAG, LangChain, Embeddings, Vector Search, NLP
Databases & Tools: PostgreSQL, SQLite, SQL Server, Docker, Git/GitHub, MLOps, AWS, Azzure, Power BI

Projects

Video Intelligence Platform with Prediction & Recommendation | (GitHub Link) **|** (AWS LINK) **|** (Demo Video)

Built an end-to-end AI video intelligence platform that converts educational videos into searchable, interactive knowledge using speech-to-text, semantic search, RAG and conversational AI. Developed a learner performance prediction model using Extra Trees to predict next quiz scores, achieving R^2 0.861 and 3.13% MAE on unseen users. The platform recommends relevant videos based on learners' weak topics to support targeted learning and improve understanding. Integrated an AI chatbot that understands learner questions, retrieves the relevant content and provides exact, clickable timestamps that take users directly to the requested section of the video, enabling faster and more focused learning.

AI Chatbot Integrated Retail Intelligence & Prediction Platform | (GitHub Link) **|** (AWS LINK) **|** (Demo Video)

Built an end-to-end customer intelligence and pricing platform using 797K+ retail transactions across 5,939 customers and 4,646 products. Developed models for customer churn, revenue forecasting, RFM segmentation and 90-day SKU demand forecasting, achieving 0.831 ROC-AUC for churn prediction and 31.84% sMAPE for demand forecasting. The platform helps retailers understand which customers are most valuable, who may stop purchasing, which products are likely to be needed and when stock should be replenished. It also supports targeted promotions, price optimisation and inventory planning through price-elasticity, safety-stock, reorder-point and suggested-order calculations. Added PSI/KS drift monitoring to identify changes in data and model behaviour, and deployed the complete platform on AWS using Docker.

Autonomous Data Science Platform – AI chatbot integrated | (GitHub Link) **|** (Demo Video)

Built an autonomous data science platform that takes raw datasets and automates the ML workflow from data profiling and quality checks to model selection and explainability. Implemented automated problem-type detection, feature engineering, preprocessing, model benchmarking and champion-model selection using cross-validation. Added leakage detection, untouched holdout evaluation, threshold optimisation and SHAP explainability, with an AI layer generating evidence-based analysis from validated model results**.**

Vendor Invoice & Freight Cost Intelligence | (GitHub Link) **|** (Live Site Link) **|** (Demo Video)

Built an end-to-end invoice intelligence system to predict vendor freight costs and identify high-risk invoices requiring manual review. Performed SQL-based feature engineering, EDA, statistical testing and model benchmarking, comparing regression and classification approaches. Optimised the invoice-risk model using GridSearchCV and F1-score, addressing class imbalance and enabling real-time prediction through the deployed application.

NLP Emotion Detection | (GitHub Link) **|** (Live Site Link) **|** (Demo Video)

Built a real-time emotion detection system that classifies the emotional state expressed in user-provided text using NLP and machine learning. Developed the complete pipeline from text preprocessing and feature extraction to model training, evaluation and prediction. Deployed the trained model as an interactive application, demonstrating an end-to-end approach to transforming unstructured text into machine-learning predictions.

Education

MSc Data Science | **Northumbria University** | *Jan 2025 – June 2026* | Newcastle, UK (64%)

Computer Science Engineering | **DBATU** | *Jan 2020 – Jul 2024* | Maharashtra, India (6.90 CGPA)