Akash Rane , MS

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TECHNICAL SKILLS

Programming & Data Processing: Python (Pandas, NumPy), SQL (PostgreSQL, MySQL), R (basic), C++, Java, HTML, CSS, JavaScript.
Machine Learning & AI: Predictive/Prescriptive Modeling, XGBoost, Random Forest, Linear Regression, Neural Networks (TensorFlow, Keras), Scikit-learn, SHAP, Model Tuning & Evaluation
Data Engineering & APIs: FastF1, Open-Meteo API, Ergast API, Web Scraping (Selenium), OPC-UA, REST APIs
Data Visualization & BI Tools: Matplotlib, Seaborn, Power BI, Grafana, Node-RED, Influx DB.
Tools & Workflow: Jupyter Notebook, VS Code, Git, Agile/Scrum, Google Colab, Cloud familiarity (AWS basics).

PROFESSIONAL EXPERIENCE

Optify Industrial Solutions Pvt. Ltd. Pune, India
Computer Science Engineer & Business Intern Jul 22 – Dec 23

- Developed a Python-based analytics tool that processed factory sensor data to generate daily performance reports, enabling factory owners to make faster production and maintenance decisions.
- Designed interactive dashboards using Node-RED and Grafana (*Open- Source Tools*) to visualize control panel metrics, improving operational oversight and user navigation efficiency.
- Established and implemented OPC-UA and MQTT protocols in Python to enable real-time data transmission between control systems and dashboards, improving system automation and data accessibility.
- Led a 1-month on-site deployment, configuring communication interfaces and debugging control system issues, ensuring 100% operational integration at client site.
- Created data-backed pitch decks highlighting operational efficiency, and successfully pitched to government agencies, leading to the approval of innovation grants.

PROJECTS

American Express Default Prediction May 2026

- Developed a Dask-powered pipeline to ingest and preprocess ~100 K training and ~925 K test records—imputing missing data, one-hot encoding categoricals, and standard-scaling numerics via a ColumnTransformer.
- Mitigated severe class imbalance with an imbalanced-learn SMOTE + RandomUnderSampler pipeline, boosting minority-class recall and stabilizing model performance in real-world credit pools.
- Ran exhaustive model selection and hyperparameter tuning (Random Forest, XGBoost, CatBoost, LightGBM) with 3-fold cross-validation, deploying a LightGBM model that achieved out-of-sample ROC AUC > 0.82.
- Integrated SHAP to surface top default drivers (e.g., utilization ratios, payment timeliness), and automated submission-ready CSV output for seamless integration into downstream risk-scoring systems.

Formula 1 Pitstop & Driver Position Strategy Mar 2025

- Built an end-to-end ML pipeline to predict driver position changes based on pit stop timing, tire strategy, and weather conditions.
- Retrieved the data from multiple APIs race telemetry, lap data, and real-time weather features using FastF1, Open-Meteo, and Ergast APIs into a single Dataset.
- Trained and optimized an XGBoost model ($R^2 = 0.944$), outperforming baseline Random Forest and Linear Regression models.
- Used SHAP for model to evaluate the impact of strategic variables like pit stop timing and tire choices on race outcomes.
- Currently developing a real-time dashboard for race-day data analysis and predictive insights.

Automated Operational Analytics and Reporting Oct 21

- Developed a python automation script leveraging Matplotlib, Pandas and Influx DB, to streamline data processing and generate daily operational reports for factory owners, saving 30% of time and enhancing data driven decision-making.
- Created a single compound graph to deliver comprehensive insights into 8 key metrics of factory operation which Influenced in immediate operational oversight and efficiency for the factory.
- Helped to improved decision-making by factory owners through actionable insights on energy usage & system uptime.

EDUCATION

Pace University, Seidenberg School of Computer Science and Information Systems New York, NY
Master's in Computer Science | **Concentration**: Data Science | GPA**: 3.89/4.00** Dec 25
SPPU - Savitribai Phule Pune University Pune, India
Bachelor of Engineering in Computer Engineering | **Concentration**: Data Science | **GPA: 8.18/10** Jul 22

PUBLICATIONS

Title: Application for Real Time Object Measurement, Journal: International Journal of Advanced Research in Science, Communication and Technology, Year: 2022, Link: IJARSCT_Paper5228
Title: An Experimental Assessment of Deep Learning on Highway Driving, Journal: Journal of Science and technology at National Conference on Cognitive Computing., Year:2021, Link: [Paper, Certificate]