Karthik Reddy Burugu

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PROFILE

A highly skilled Data Scientist with expertise in Time Series Analysis and developing Machine Learning models for Energy Management and Product Optimization in the Oil and Gas Sector. Proficient in refining processes, I have successfully contributed to projects at Reliance Industries in Fluid Catalytic Cracker operations and played a key role in the Digitization 4.0 department at Ingenero Technologies. Currently seeking a Data Scientist role at a leading multinational company to spearhead the design, development, and implementation of cutting-edge technologies on a larger scale.

EDUCATION & QUALIFICATIONS

Aston Business School - master's in business Analytics (2022)

- Descriptive Analytics, Performance Analytics, Big Data for Decision Making, Decision Models.

- Expertise in various statistical techniques, Big Data, and Machine Learning.

- Technical skills: Python, SQL, Pandas, R, Power BI, Excel, Aspen Hysys.

National Institute of Technology-Calicut - bachelor's degree in chemical engineering (2018)

- Relevant coursework: Calculus (grade A), Operational Research (grade B), Statistics (grade B), Chemical Process Optimization (grade A).

- Knowledge of statistics, Mass Transfer, Heat Transfer, Thermodynamics, Fluid Mechanics, Petroleum Refining Engineering.

WORK EXPERIENCE

Data Scientist | Ingenero Inc. **Aug 2022-Present**

Ingenero provides world class engineering to tackle everything from minor process verification and analysis to taking an idea through construction and on to ongoing production.

- Lead Spearheaded data-driven model development by collaborating closely with stakeholders to collect, preprocess, and visualize industrial process datasets, ensuring data integrity and relevance.
- Independently designed, implemented, and managed analytical solutions and techniques, seamlessly integrating MLOps practices for enhanced operational efficiency.
- Established CI/CD pipelines using Git and Data Version Control for efficient model development and deployment.
- Streamlined workflows through Python automation, significantly enhancing productivity while leveraging advanced data regression models for predictive analytics and time series analysis.
- Employed cutting-edge data mining algorithms to extract actionable insights from complex datasets, effectively addressing intricate business challenges and driving informed decision- making.
- Proficiently utilized TensorFlow and other Deep Learning frameworks to construct and fine- tune neural networks, advancing the precision of predictions and enhancing model performance.
- Applied statistical techniques and machine learning methodologies such as Classification, Clustering, and Multivariate Regression to extract meaningful patterns and correlations, contributing to optimal solutions for clients.

- Collaborated effectively within cross-functional teams, fostering transparent communication and adherence to industry data security best practices.
- Delivered compelling project pitches, deliverables, and status presentations to clients, ensuring seamless comprehension of complex technical concepts.
- Expertly navigated a range of technology stacks including Spark, AWS ensuring adaptability to diverse client environments and requirements.
- Key skills: Tensor Flow, Deep Learning, Time Series, Neural Networks, Classification, Clustering, Multivariate Regression, Python, Support Vector Machine, PCA, PLS

Senior Analyst | IPAC (Indian Political Action Committee.) **June 2022 - Aug 2022**

IPAC is an Indian political strategy consultant which helps political parties by giving strategy decisions through data analytics.

- Extracted insights from electoral and demographic data using advanced statistical techniques.
- Applied ML and AI models to drive actionable business insights, optimizing campaign productivity.
- Designed algorithms for sentiment analysis using data from digital platforms, improving survey accuracy.
- Analyzed unstructured datasets and ensured data completeness and consistency for informed decision- making.
- Managed cross-functional teams, adhering to industry data security best practices.
- Automated performance reports using Python and Power BI.

Data Analyst | Reliance Industries Limited **Aug 2018 to Dec 2020**

RIL is world´s largest oil refinery at single location with a capacity to refine crude oil of 2.2 million barrels per day.

- Analyzed daily production data and product specifications, optimizing plant performance with Aspen Simulation and advanced statistical techniques.
- Collaborated with cross-functional teams to gather and analyze data, identifying trends and insights for process optimization.
- Conducted statistical analyses and presented findings to improve decision-making processes.
- Utilized Python for data analysis and visualization, contributing to the development of actionable insights.
- Automated daily production reports using python which helped in taking swift decisions and increased the work efficiency.

KEY SKILLS:(Transferable Skills)

- **Critical and Problem-solving:** Proficient in researching and analyzing large datasets to derive valuable insights.
- **Communication:** Demonstrated strong communication skills in connecting with diverse stakeholders.
- **Team Player:** Collaborated effectively with multidisciplinary teams across various projects.
- **Presentation:** Delivered compelling project pitches, deliverables, and status presentations to clients.
- **Leadership:** Led a team of 3 members from project development to deployment.

TECHNICAL SKILLS

- Python
- Azure Devops/Azure DataFactory
- Databricks
- PySpark
- SQL
- Power BI

PROJECTS

- **Data-driven Soft Sensor Development for Real-time Quality Specification Prediction**
    - Developed and deployed 3 soft sensors for critical process units, including Propane-propylene splitter (PPS), Debutaniser Column (DB), and Gasoline Column (GC).
    - Utilized PCA and XgBoost algorithm to predict MAPD content for PPS, C5's in overhead for DB, and IBP Value in GC overheads, ensuring adherence to product specifications.
    - Built a process monitoring dashboard using Power BI, presenting key performance indicators (KPIs) and process trends for enhanced decision-making.
    - These soft sensors significantly contributed to maintaining product specs, optimizing process efficiency, and minimizing deviations.

- **Machine Learning Model for Predicting Heat Exchanger Fouling Rate and Remaining Useful Life**
    - Developed and deployed a PLS Regression model to predict fouling rates of 6 Heat Exchangers, enabling timely maintenance and preventing unplanned downtime.
    - Implemented ARIMA-based Forecasting model to predict Remaining Useful Life, optimizing preventive maintenance scheduling and asset management.
    - Created analytical dashboards in Power BI to visualize and communicate insights effectively to stakeholders.
    - The predictive models significantly improved equipment reliability and reduced maintenance costs.

- **Online Decoke Forecaster for Predictive Maintenance of Furnace**
    - Developed an equipment reliability model using survival analysis to forecast equipment failure, enhancing predictive maintenance strategies.
    - Implemented the model to monitor furnace conditions and predict decoking schedules, improving equipment reliability and reducing downtime.
    - Created an analytical dashboard for real-time monitoring and decision-making, utilizing data insights to optimize maintenance planning and extend equipment lifespan.