Tirth Patel

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Summary

Data Analyst with over 3 years of experience specializing in machine data analytics, advanced visualization, and process optimization. Adept at delivering client-centric solutions by leveraging Python scripting, SQL query optimization, and Tableau dashboard development. Demonstrated success in boosting process efficiency by 30%, engineering innovative analytical tools, and generating actionable, data-driven insights. Skilled in identifying operational enhancements and collaborating with stakeholders to maximize engagement and boost project adoption by 20%. Eager to secure a data science position to refine industrial performance and pioneer cutting-edge analytical methodologies.

Key Skills: Python, SQL, Tableau, Scikit-Learn, Big Data Optimization, Statistical Analysis, Team Collaboration

Experience

Data Analyst **November 2022 – August 2024**
Caterpillar Inc. *Peoria, Illinois*

- Conducted in-depth machine data analysis using Python, delivering actionable insights aligned with project goals.
- Optimized Python scripts for big data processing, reducing runtime and memory usage by 20%.
- Applied statistical methods to real-time sensor data, enhancing component condition assessments and predictive maintenance.
- Designed and deployed 30+ live Tableau dashboards for real-time data visualization, improving decision-making efficiency by 10%.
- Wrote and refined SQL queries to extract histogram data from a 30+ billion-record database, cutting load times by 33%.
- Enhanced 10+ internal Python libraries with new functions for data quality assessment and compilation, streamlining workflows.
- Modernized 60+ legacy SQL queries to meet updated company standards, improve maintainability and query performance by 50%.
- Performed Rainflow analysis to estimate IGBT lifespan, resolving data channel conflicts and validating methodologies.
- Developed a Scikit-Learn clustering algorithm to analyze power output data, forecasting emission rates with visualized cluster plots.

Research Assistant **April 2021 – October 2022**
University of Illinois *Urbana Champaign, Illinois*

- Developed and tested surface-cleaning methods for 2D materials (e.g., graphene), optimizing transfer processes.
- Investigated graphene properties across substrates and layer thicknesses (monolayer to few-layer), contributing to material science advancements.
- Designed tools, machines, and parts using 3D design software, supporting experimental setups.
- Routinely etched tungsten tips for STM, ensuring precision in scanning tunneling microscopy experiments.

Projects

Int'l High Tech Championship: Neural Network and Big Data | *PyTorch, Dalle2, ImaGen* **September 2023**

- Built a neural network using DALL·E 2 and Imagen to generate captioned image datasets, leveraging MS-COCO, ImageNet, and CC12M.
- Optimized code for efficiency on resource-limited platforms (e.g., Colab, Jupyter Notebook), reducing processing time by 25%.
- Integrated GigaChat and Kandinsky 2.2 APIs to create image prompts and generate visuals from key phrases.
- Added user-friendly features, including offline mode and content filters, enhancing accessibility and safety.

Noise Profiles in the Vicinity of Wind Turbines | *Python, Juypter Notebook, Arduino* **Spring 2020**

- Engineered a PCB device with sensors for noise, wind speed, pressure, and temperature measurements.
- Developed DAQ and analysis code in Python, producing clear, actionable data visualizations.
- Created a miniature prototype to validate data and troubleshoot errors, improving experimental accuracy by 10%.

Technical Skills

- **Languages**: Python, SQL, C, C++, Java, R
- **Libraries/Frameworks**: PyTorch, Scikit-Learn, DALL·E 2, Imagen, Pandas, NumPy, Matplotlib, Seaborn, Adafruit
- **Tools/APIs**: Tableau, IntelliJ IDEA, JSON, GigaChat, Kandinsky 2.2, Jupyter Notebook, Arduino
- **Datasets**: MS-COCO, ImageNet, CC12M

Education

University of Illinois, Urbana Champaign **Aug. 2019 – Dec 2021**
Bachelor of Science in Physics and Mathematics, GPA: 3.7/4.0 *Urbana-Champaign, Illinois*