Interactive Real-Time Muon Data Visualization: A Dashboard for Cosmic Sensor Networks

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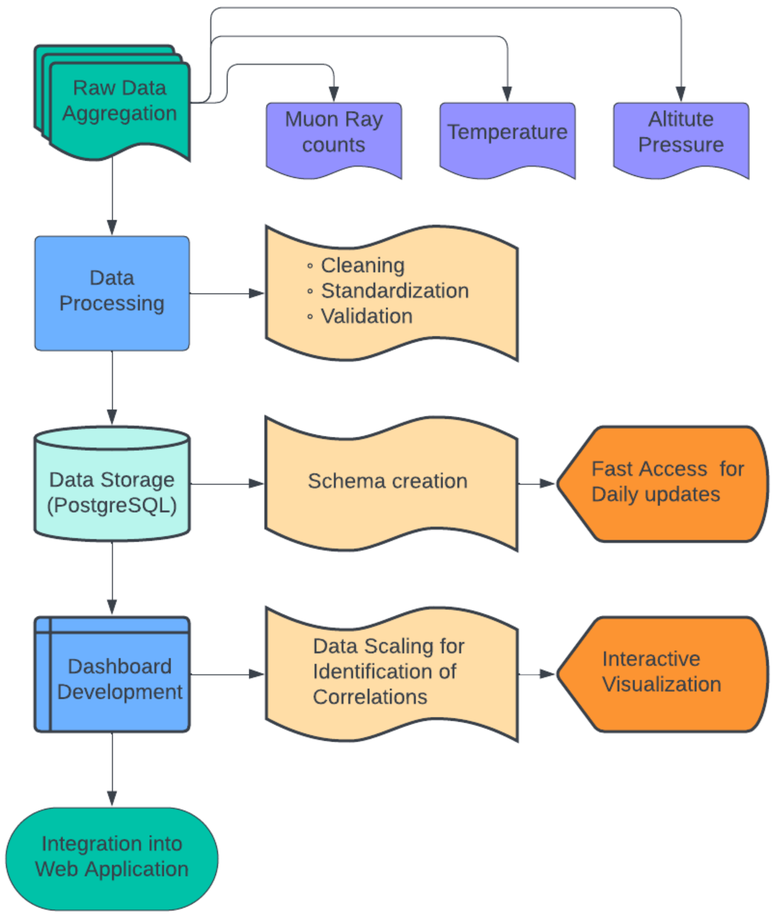
A data pipeline developed for the collection, processing, and visualization of muon data from a global network of cosmic ray sensors, along with an interactive dashboard and web application hosting the dashboard. The system is designed to handle large volumes of data in real-time, providing researchers with a user-friendly interface for monitoring cosmic ray activity and analyzing variations detected across the sensor network. These insights can contribute to a deeper understanding of larger climate-related phenomena.

DEVELOPMENT AND IMPLEMENTATION



TECHNOLOGY

Python · PostgreSQL · Plotly | Dash · Flask · Gunicorn · pandas · mapbox

UTILIZATION

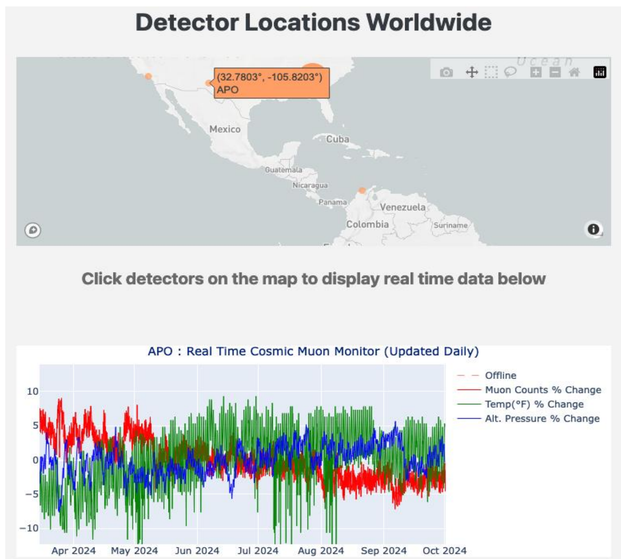
Impacts:

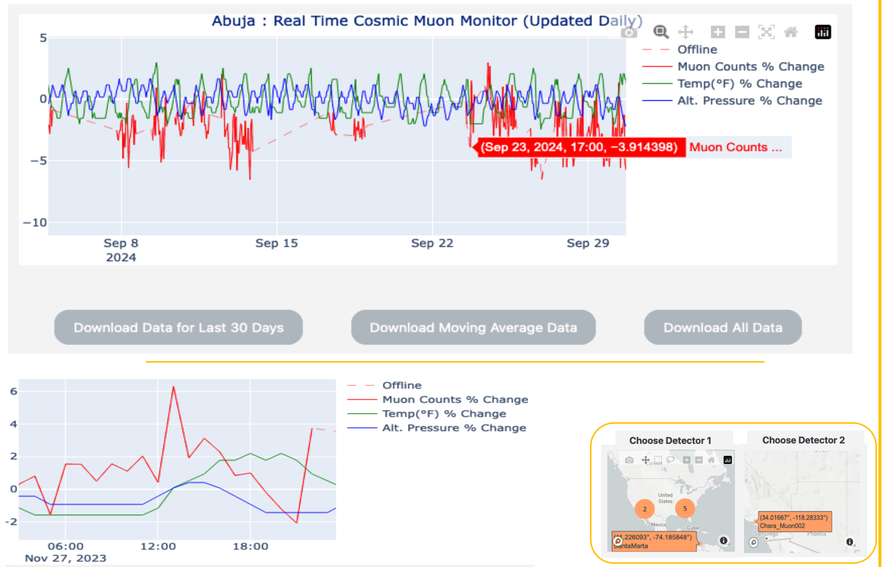
- Interactive non-technical platform providing easy access to the data
- Real-time visualization of data from global network
- Data download and comparison capabilities

Who can use it?

- **Researchers** → Study atmospheric changes, solar-climate interactions, and provide long-term data.
- **Educators** → Foster global collaboration in STEM education through shared climate datasets.
- **Students** → Understand interdisciplinary climate issues and develop critical data science skills.
- **Public** → Awareness of climate change impacts globally and importance of cosmic muon ray research.

RESULTS





Acknowledgement: This work is supported by the GSU RISE initiative. The detector technology was developed with funding support by the US Department of Energy and the Brookhaven National Laboratory (BNL) in nuclear physics experiments at BNL.