

Projeto/Estágio 2024/2025

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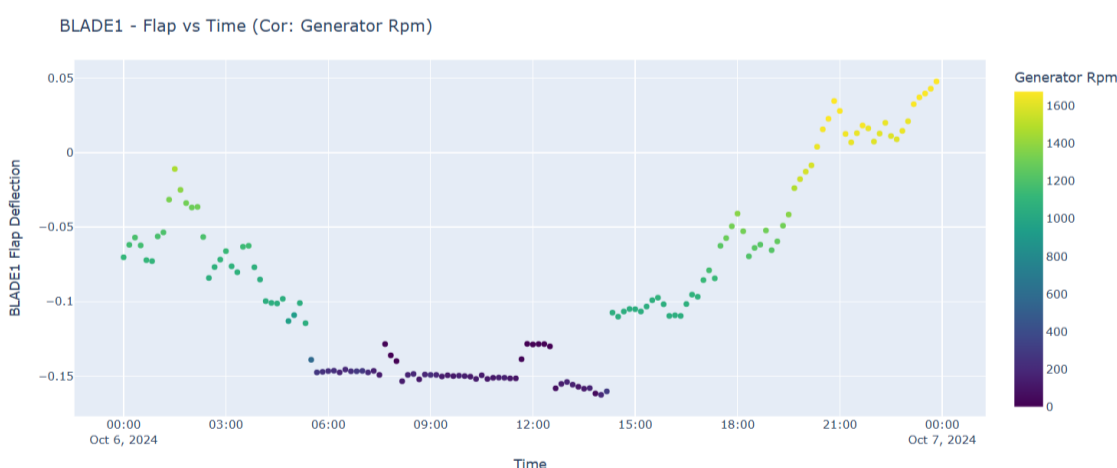
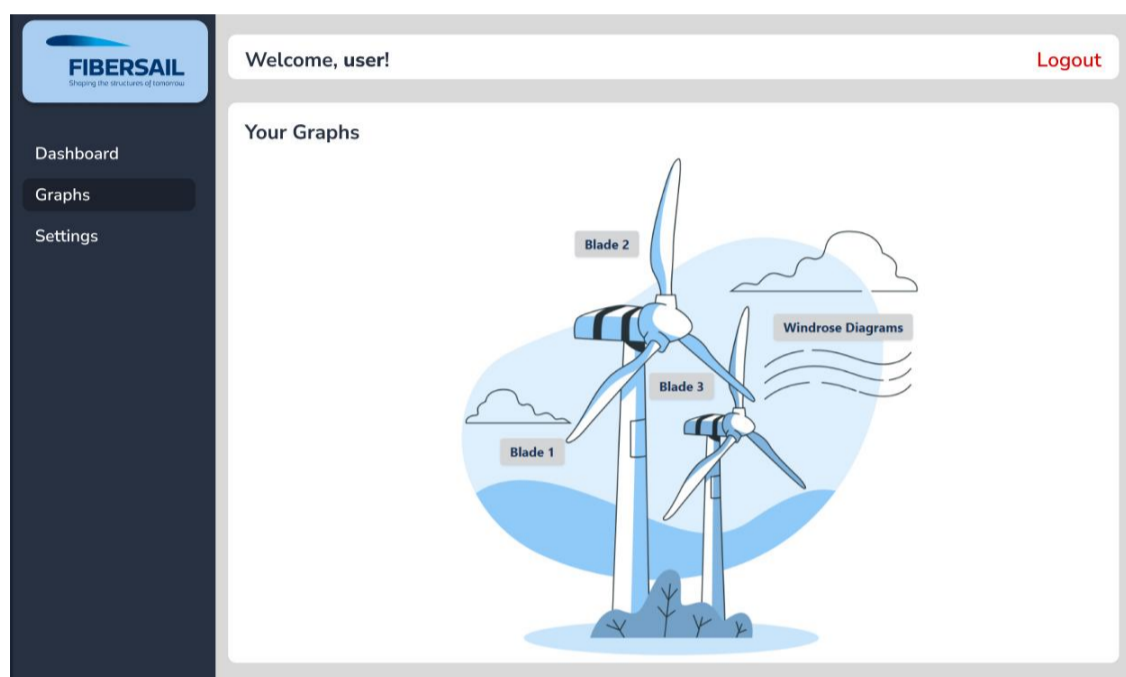
Company: Fibersail

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Wind Turbine Monitoring Dashboard

The growing dependency in sources of renewable energy, namely wind energy, has pushed the development of advanced technological solutions that guarantee reliability and efficiency in electrical generation systems. Wind turbines, as critical generation infrastructures, frequently operate in remote environments and are subject to adverse meteorological conditions, imposing elevated demands in terms of maintenance, monitoring and operational management.

The use of structured monitoring systems, based on intelligent sensors distributed along the turbine, grant the gathering of data on their physical and operational state. These systems are fundamental to implement predictive monitoring and premature structural failure detection strategies, thus contributing to the reduction of operation costs and augment of the availability of equipment as well as prolonging its service life.



The project developed falls within the intersection of instrumentation, data treatment and interactive interface development, its main goal being the development of a data visualization platform (an interactive dashboard) capable of presenting, in a clear and functional manner, the data gathered by the turbine sensors. The dashboard aims to adapt depending on the user's profile, distinguishing between users with administrative functions and technical users. This is done to guarantee that the former view aggregated data that is more easily interpreted, while the latter can consult more detailed and specific technical metrics.

The implemented solution required a research phase not only in renewable energy but in statistical data treatment as well.

The backend was developed using Python along with libraries like Flask, Plotly, Pandas, Matplotlib, NumPy and Kaleido to assure the website's safety and access management and the creations of interactive graphs. To develop the frontend, HTML was used as well as the library TailWindCSS.

Your Dashboard

Wind Turbine Monitoring Table

Select Time Interval: 2024-10-06 00:00:00

Show 10 entries

Search:

Time	Parameter	Mean	Status
2024-10-06 00:00:00	Wind Speed	5.95	●
2024-10-06 00:00:00	Rotor Rpm	10.87	●
2024-10-06 00:00:00	Generator Rpm	1138.84	●
2024-10-06 00:00:00	Grid Actual Power	312.85	●

Showing 1 to 4 of 4 entries (filtered from 96 total entries)

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