

Climatic Convolution

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1 Abstract

The intensification of extreme weather events due to climate change has underscored the urgency of accurate severe climate prediction. This project embarks on a transformative journey by merging the potential of data visualization with the prowess of machine learning to elevate the precision and interpretability of severe climate forecasts. The central objective is to construct an innovative framework that seamlessly integrates cutting-edge data visualization methodologies and state-of-the-art machine learning algorithms, fostering a holistic approach to address the challenges of severe climate prediction.

The project involves curating extensive climate and weather data, encompassing historical records of temperature, precipitation, wind patterns, pressure systems, and other relevant variables. Leveraging this dataset, various machine learning algorithms will be explored, including deep learning architectures, to develop predictive models capable of forecasting severe climate events such as hurricanes, droughts, heatwaves, and heavy rainfall.

Furthermore, the project emphasizes the role of data visualization in conveying complex climate data and model predictions in a comprehensible manner. Interactive and dynamic visualization tools will be designed to illustrate the spatiotemporal patterns of climate variables, aiding users in understanding the evolving climatic conditions and potential risks. These visualizations will not only assist meteorologists in refining their predictions but will also provide valuable insights for decision-makers and the public, enabling better preparation and response strategies.

This project involves the usage of matplotlib and tableau as primary tools for data visualisation to convey generated results to the concerned body. Furthermore, machine learning is employed by connecting certain deep learning models to train our model with the curated dataset and generate precise predictions.

Dataset link:-<https://www1.ncdc.noaa.gov/pub/data/swdi/stormevents/csvfiles/>

Overleaf link:- <https://www.overleaf.com/9676115815dnynrrdnqyy>