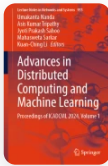


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Evaluation of Weather Forecasting Models and Handling Anomalies in Short-Term Wind Speed Data

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Abstract

The economic and reliable functioning of power systems with a high level of wind power penetration depends on accurate forecasts of wind speed. Weather forecasting models are useful for understanding and forecasting wind speed trends and their implications. Predictions vary across regions, and there is a need to evaluate them before performing time-series analysis for wind energy production. In this work, the proposed system evaluates weather forecast models such as GFS and Meteoblue with data from three places in the southern region of India, including Aranvoyal, Palakkad, and Sengottai, over a period of two years. Live data from these wind farms is used in combination with the forecasts to identify suitable forecast model for the region. This work also takes into consideration that the incoming live data is prone to environmental and mechanical disturbances. It uses linear and decision tree regression to handle anomalies in the dataset. The analysis reveals that Meteoblue forecasts provide better results with 76.04% accuracy, and linear regression provides good imputation results for a period of three hours.