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Wind Power Generation Data Forecasting

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Abstract: Wind power generation is highly variable due to fluctuating weather conditions, necessitating accurate forecasting to ensure grid stability and efficient energy management. This study explores the application of the Random Forest algorithm, a robust ensemble learning method, for forecasting wind power generation. Utilizing the algorithm the model is trained using windspeed and power generation data. to predict future power output. The algorithm's ability to handle non-linear relationships and interactions among multiple variables enhances its predictive accuracy. Results indicate that the Random Forest model outperforms traditional forecasting methods, providing more reliable and precise predictions, which are crucial for optimizing wind energy integration into the power grid.

Keywords: Wind Power Forecasting, Random Forest Algorithm, Ensemble Learning, Renewable Energy, Grid Stability, Energy Management, Time Series Forecasting, Machine Learning, Predictive Modelling, Weather Prediction

