LITERATURE SURVEY:

PredictingtheWindTurbinePower Generationbased on Weather Conditions

PROBLEM :

There exist a number of technological, environmental and political challenges linked to supplementing existing electricity generation capacities with wind energy. Here , mathematicians and statisticians could make a substantial contribution at the interface of meteorology and decisionmaking, in connection with the generation of forecasts tailored to the various operational decision problems involved. Indeed, while wind energy may be seen as an environmentally friendly source of energy, full benefits from its usage can only be obtained if one is able to accommodate its variability and limited predictability. Based on a short presentation of its physical basics, the importance of considering wind power generation as a stochastic process is motivated. The conventional movingaverage statistical models were proven to be less efficient in forecasting the wind energy, as the wind speed is inherently variable quantty.

SOLUTION:

Our approach was to use a time series forecasting model that would generate point forecasts of wind generation for the upcoming three days, for a wind turbine. We used publicly available historical weather data of a wind plant to train model and learn the changing weather patterns. We also used it to find the correlations among different weather attributes and their effect on energy output. We have used a VAR (Vector Autoregressive) model, multivariate time-series model to handle multiple time series of different weather attributes. We have presented our results in an Android application in user-friendly graphs and tables.

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OBJECTIVE:

It is quite difficult to estimate the wind power correctly despite the instabilities for a wind farm that converts the wind power to electrical energy. The climate at the location determines how much power a wind farm produces. In order to handle the challenges brought on by the changing weather conditions, a detailed forecast is necessary. In this paper, an end-to-end web application has been created to estimate and predict the energy production of wind turbines based on the weather. A special type of RNN called Bidirectional Long Short Term Memory was used to create the prediction model (Recurrent Neural Network).

ADVANTAGE:

Unlike conventional procedure, the proposed model, that is currently running on the production server, would operate on the specific real-world data and provide users with predictions.

DISADVANTAGE:

Only weather parameters have been considered in this application. By refining the model and incorporating it into the current application, other features like blade radius, can also be added

REFERENCES

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