

NAME OF THE PAPER: Energy Modeling Output of Wind System based on Wind Speed

NAME OF THE AUTHOR: Abdelkader Harrouz, Ilhami Colak, Korhan Kayisli

JOURNAL PUBLISHED: 2019 8th International Conference on Renewable Energy Research and Applications (ICRERA)

MONTH AND YEAR PUBLISHED: November 2019

OBJECTIVE OF THE PROJECT:

There are many renewable energy sources that can be used to obtain electrical energy from natural sources in the world. Especially, wind energy plays an increasing role thanks to its feasibility and efficiency. Due to the source of wind energy, efficiency of wind farm is highly depending on the weather conditions. The main issue to obtain maximum performance is to predict the output. This situation provides collaborative production of different energy sources more efficiently with avoiding over-cost and overproduction. In this paper, there are three different wind models are modelled and simulated with choosing the complete and correct models.

NAME OF THE PAPER : Short term wind and energy prediction for offshore wind farms using neural networks

NAME OF THE AUTHOR:Stefan Balluff, Jörg Bendfeld, Stefan Krauter

JOURNAL PUBLISHED: 2015 International Conference on Renewable Energy Research and Applications (ICRERA)

MONTH AND YEAR PUBLISHED:November 2015

OBJECTIVE OF THE PROJECT:

Forecasting short term wind speed is of high importance for wind farm managers. The knowledge of the expected winds helps taking decisions (decision support) as the likes of maintenance and repair jobs or finishing works as health and safety is not guaranteed anymore. There are a number of methods and computations currently being used for forecasts: fuzzy logic, linear prediction or neural networks. For the latter there are also various algorithms and methods, from feed forward up to recurrent neural networks (RNN) and long short-term memory (LSTM). Recurrent neural networks belong to the group of machine learning algorithms and are part of artificial intelligence research. This paper is about forecasting wind speed and pressure using RNN

NAME OF THE PAPER : Pattern-Based Wind Speed Prediction Based on Generalized Principal Component Analysis

NAME OF THE AUTHOR : Qinghua Hu, Pengyu Su, Daren Yu, Jinfu Liu

JOURNAL PUBLISHED : IEEE Transactions on Sustainable Energy

MONTH AND YEAR PUBLISHED : April 2014

OBJECTIVE OF THE PROJECT :

Short-term wind speed prediction plays an important role in large-scale wind power penetration. However, there is still a large gap between the requirement of prediction performance and current techniques. In this paper, we propose a pattern-based approach to short-term wind speed prediction. It is well accepted that wind varies in different patterns in different weather conditions. Thus, we should use different models to describe these patterns, whereas most current works conduct wind speed prediction with a single model. Based on this observation, we introduce generalized principal component analysis to automatically discover the patterns hidden in the historical data of wind speed. Then we train a predicting function for each pattern and combine their outputs for the final prediction. Experimental results show that the proposed approach performs better than the clustering-based approach, a single model, and persistence forecasting.

NAME OF THE PAPER: Wind power prediction using wavelet transform and chaotic characteristics

NAME OF THE AUTHOR : Lijie Wang, Lei Dong,Ying Hao, Xiaozhong Liao

JOURNAL PUBLISHED : 2009 World Non-Grid-Connected Wind Power and Energy Conference

MONTH AND YEAR PUBLISHED : September 2009

OBJECTIVE OF THE PROJECT :

In the electricity system, supply and demand must be equal at all times. Wind power generation is fluctuating due to the variation of wind. As more and more wind power generation is integrated into the power system, it is very important to predict the wind power production to contribute the system reserve reduction and the operational costs of the power plants. This paper brings wavelet transform into the time series of wind power and verifies that the decomposed series all have chaotic characteristic, so a new method of wind power prediction in short-term with Artificial Neural Network (ANN) model based on wavelet transform is presented. To test the approach, the wind power data from the Fujin wind farm and Saihanba wind farm of China are used for this study. The prediction results are presented and compared to the no wavelet transform method and ARMA method. The results show that the new method based on wavelet transform neural networks will be a useful tool in wind power prediction.

NAME OF THE PAPER: The Use of Machine Learning and Performance Concept to Monitor and Predict Wind Power Output

NAME OF THE AUTHOR: Kelvin Palhares Bastos Sathler, Athanasios Kolios

JOURNAL PUBLISHED: 2022 International Conference on Electrical, Computer and Energy Technologies (ICECET)

MONTH AND YEAR PUBLISHED: July 2022

OBJECTIVE OF THE PROJECT:

Monitoring and predicting wind power output more precisely can be very beneficial for an increasingly competitive Wind Power industry. Although many advances have been made throughout the last decades, the production forecast is still based mainly on the manufacturing power curve and wind speed. Even though this approach is very useful, especially during the design phase, it does not consider other factors that affect production, such as topography, weather conditions, and wind features. A more precise prediction model that is able to recognize production fluctuation and is tailored using current operational data is proposed in this paper. The model analyzes the performance through Meteorological Mast Data (Met Mast Data) and then uses it as an input to monitor and predict power output.