Abnormal power generation rate of wind turbines

How can anomaly detection improve the reliability of wind turbines?
Continuous monitoring of wind turbine health conditionsusing anomaly detection methods can improve the reliability and reduce maintenance costs during operation of wind turbine. Anomaly detection aims at identifying the root causes leading to unexpected changes of product performance.

How to determine if a wind turbine performance is abnormal?
Anomaly detection with adaptive thresholdFor deciding whether the performance of a wind turbine is abnormal or not,fixed thresholds were mostly used in the existing methods. Due to the uncertain nature of wind profiles,the operating conditions vary greatly during the operation of wind turbines.

Do wind turbines fail?
Wind turbines are subjected to different sort of failures; thus,before starting to identify various kinds of errors,it is necessary to identify what kind of failures can be found in the real world which causes healthy operation of WTGs.

Can LSTM-sdae and XGBoost detect anomaly in wind turbines?
CONCLUSIONS and future work An anomaly detectionand diagnosis method for wind turbines using LSTM-SDAE and XGBoost is proposed in this paper. An abnormal data recognition algorithm based on the LOF and adaptive K-means was first developed to implement data preprocessing and noise extraction.

How do wind turbine condition monitoring and anomaly detection work?
These collected sequential data can reflect the performance conditions of wind turbines. The existing approaches for condition monitoring and anomaly detection of wind turbines belong to either model-based approaches or data-driven approaches (also known as knowledge-based approaches).

Why do wind turbines have a 'normal' performance?
Due to the uncertain nature of wind profiles, the operating conditions vary greatly during the operation of wind turbines. Therefore, the criteria for "normal" performance of wind turbines vary from moment to moment, and the use of fixed thresholds to identify abnormal performance datapoints may result in wrong classifications.

wind turbine power are analyzed in detail and out of this a ... usually an indicator of abnormal wind turbine operation. (2) The bins method only reflects the relationship between ... optimal value ...

Wind power plant capacity has increased by approximately 52 GW, and cumulative plant ca-pacity reaching 539 GW accounts for approximately 21 % of renewable energy. Wind power is one of ...

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Wind turbine blade is an important part of wind turbine, which undertakes the important work of wind power generation. Because the working environment of the wind turbine blades is very ...

This paper creatively proposes a complete set of procedures to identify and eliminate outliers of wind-power data based on the framework of classification processing. Outliers are divided into ...

In this study, machine learning approaches are applied as an online tool to detect abnormal wind turbine operation modes, evaluating the wind turbine operation in all regions of the power curve. The methodology has been ...

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