Egypt fault detection in smart grid

Is autonomous smart grid fault detection possible?

A case study is introduced as a preliminary study for autonomous smart grid fault detection. In addition, we highlight relevant directions for future research. Smart grid plays a crucial role for the smart society and the upcoming carbon neutral society.

Can deep learning improve fault detection and classification in smart grids?

Deep learning emerges as a promising tool for enhancing fault detection and classification within smart grids, offering significant performance improvements. Content may be subject to copyright.

Can computational intelligence detect islanding phenomenon in smart distributed grids?

The importance of computational intelligence to detect islanding phenomenon in smart distributed grids , , , . Those works present a probabilistic Neural Network (NN) and Support Vector Machine (SVM) as powerful self-adapted machine learning techniques for fault detection.

How is fault detection based on a system model?

In fault detection,those methods are based on the system model by using knowledge of the system to create an analytical mathematical model. Many analytical methods implement a general-purpose estimation method for the particular detection process.

What is a fuzzy detection and automatic fault classification system?

In this research, a fuzzy detection and automatic fault classification system was developed for the power grid, with the help of WHO-optimized random forest and decision tree algorithms, as well as ANFIS-assisted fault localization for various TL configurations with 11 types of faults.

How smart grids improve the reliability and adaptability of the electricity grid?

The reliability and adaptability of the electricity grid are improved by the incorporation of intelligent devices,which is made possible by smart grids .

Timely detection of electrical faults is of paramount importance for efficient operation of the smart grid. To better equip the power grid operators to prevent grid-wide cascading failures, the detection of fault occurrence and its type must be accompanied by accurately locating the fault. In this work, we propose a multi-task learning architecture that encodes the graph structure of the ...

make fault detection and location more reliable and reduce the danger for grid customers. Figure 1: RMS voltage in grid with intermittent earth fault III. MEASUREMENT INFRASTRUCTURE Real-time monitoring schemes requires high-resolution measurements that are reported with a low time delay (latency) to a centralized computing unit.

develop the capability of fault diagnosis and detection in the smart grids [3], [4]. The diagnosis and detection of fault have become extensively believe in power grids, data from Phasor measurement unit (PMU) is used to locate the fault index of smart ...

A brief summary of faults in smart grid infrastructure is provided by Hlalele et al. . They distinguish between faults related to power distribution, photovoltaic and wind turbines and outline possibilities of the fault identification. ... Poor HV, Tajer A (2012) Coordinated data-injection attack and detection in the smart grid: a detailed look ...

A smart grid is a system that controls, runs, and makes use of energy sources that are integrated into the smart grid through the use of smart communication technology and computerized procedures. ... including enhancements to the means of fault detection and the application of grid automation to facilitate the transition from the conventional ...

Smart grid (SG) containing clean distributed generation (DG) has gained intensive research for reliable digital protection against fault conditions. The main objective of this study is to develop and validate a fast and efficient fault detection and classification algorithm taking into account the dynamic behaviour of DG units.

Under the implementation of current hardware of the grid, faults appear frequently in routing nodes and require effective detection. This paper achieves accurate locating and isolation through the efficient detection of faults. Experiments show that it could not only improves the low detection rate and poor fault location accuracy of the current method, but ...

Timely detection of electrical faults is of paramount importance for efficient operation of the smart grid. To better equip the power grid operators to prevent grid-wide cascading failures, the ...

The fault detection is the essential factor to the reliability of the smart grid, which also provides the smart grid with the ability to self-heal and isolate to avoid or limit negative ...

1.2 . Figure 1.1. Grid Fault Taxonomy. Traditional fault detection (basic over-current detection) and analysis are performed from measurements mostly made at the substation and in some ...

Journal Article: Faults in smart grid systems: Monitoring, detection and classification Title: Faults in smart grid systems: Monitoring, detection and classification Journal Article · Tue Dec 01 00:00:00 EST 2020 · Electric Power Systems Research

the smart grid and smart grid fault detection. A. Overview of Smart Grid and Fault Detection The key components of smart grid system is shown in Fig.1. From the perspectives of power transmis-sion, power distribution and power consumption, au-tonomous smart grid fault detection is needed. 1) Power Transmission: As UHV AC and DC transmis-

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1. Autonomous smart grid fault detection is critical for system awareness, maintenance, and operation of complex modern power systems but faces challenges from new power equipment, renewable energy sources, and ...

Abstract: Timely detection of electrical faults is of paramount importance for efficient operation of the smart grid. To better equip the power grid operators to prevent grid-wide cascading failures, the detection of fault occurrence and its ...

This survey presents a structured review of the existing research into some common AI techniques applied to load forecasting, power grid stability assessment, faults detection, and security ...

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Fault Detection Method for Smart Grid. January 2014; Conference: National Conference on Power systems, Embedded systems, Power electronics, Communication, Control and Instrumentation- PEPCCI-2014 ...

Recently, anomaly detection of the smart grid has attracted a large amount of interest from researchers, and it is widely applied in a number of high-impact fields. One of the most significant challenges within the smart grid is the implementation of efficient anomaly detection for multiple forms of aberrant behaviors.

It further explores the use of big data analytics in predicting and detecting faults in the smart grid system. By analysing real-time data on voltage, frequency, and other parameters, the researchers can detect faults before they occur, reducing downtime and improving the reliability of the smart grid system. ... Outage Detection and Prediction ...

This manuscript addresses the critical challenge of fault classification and localization within smart distribution networks, exacerbated by the complex integration of distributed energy resources and the dynamic nature of modern power systems. Traditional methods fall short in accurately and efficiently managing these tasks due to their reliance on ...

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