Solar Energy South Africa

Equatorial Guinea fault detection in smart grid

Overview

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.

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 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 can faults be detected in Smart Grid Infrastructure?

These faults can be detected by means of several monitoring techniques, such as using wavelet transforms to detect the duration of disturbances in the power signal. A brief summary of faults in smart grid infrastructure is provided by Hlalele et al. (2019).

Can machine learning detect faults of smart grids?

In this paper, a reliable machine learning technique is proposed to detect and classify different faults of smart grids. The proposed technique benefits from the principal component analysis (PCA) and linear discriminant analysis (LDA). The PCA is used to reduce the size of the dataset matrixes.

How to classify faults in a smart grid?

A classification technique based-on the conventional K-NN algorithm is proposed to detect and classify different types of fault in a smart grid. In the proposed technique, the PCA method is used to decrease the dataset size while LDA provides online classification before applying the K-NN.

Equatorial Guinea fault detection in smart grid

Fault Detection, Classification And Location In Power ...

ABSTRACT Fault detection and location give to smart grid the ability to self-healing and isolating the fault in order to limit the negative consequences. In the literature, several techniques are proposed for detection ...

High Performance Platform to Detect Faults in the Smart Grid by

Inferring faults throughout the power grid involves fast calculation, large scale of data, and low latency. Our heterogeneous architecture in the edge offers such high computing performance and throughput using an Artificial Intelligence (AI) core deployed in the Alveo accelerator. In addition, we have described the process of porting standard AI models to Vitis AI and discussed its

Faults in smart grid systems: Monitoring, detection and classification

Section 5 aggregates concepts and procedures associated with the SG faults detection and location in the Smart City context. Next, Section 6 describe lessons learned and future research directions in FD/L-SG. Finally, Section 7 offers the main conclusions. Smart grid fault detection using locally optimum unknown or estimated direction

Intelligent Fault Detection and Classification Schemes for Smart ...

Effective fault detection, classification, and localization are vital for smart grid self-healing and fault mitigation. Deep learning has the capability to autonomously extract fault characteristics and discern fault categories from the three-phase raw of voltage and current signals. With the rise of distributed generators, conventional relaying devices face challenges ...

7

Part I Communication architectures and models for smart grid; Part II Physical data communications, access, detection, and estimation techniques for smart grid; 5 Communications and access technologies for smart grid; 6 Machine-to-machine communications in smart grid; 7 Bad-data detection in smart grid: a distributed approach

[2206.14150] Autonomous Smart Grid Fault Detection

Smart grid plays a crucial role for the smart society and the upcoming carbon neutral society. Achieving autonomous smart grid fault detection is critical for smart grid system state awareness, maintenance and operation. This paper focuses on fault monitoring in smart grid and discusses the inherent technical challenges and solutions. In particular, we first present ...

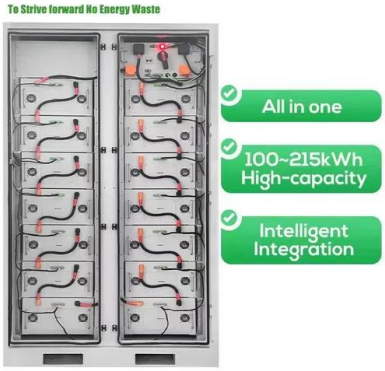
Study on smart grid fault detection based on ZigBee and

MapX

After the research and analysis of the fault monitoring system of the IoT smart grid, the following achievements obtained. (1) By applying the IoT technology to the smart grid, the ZigBee module is installed on the upper computer of each detection node on a high-voltage line to collect and analyze the fault information quickly.

Fault Detection in Smart Grid Networks by Optimizing the ...

distributed detection and localization of faults. Due to distributed detection, faults can be localized in less time. This improves the accuracy of fault detection as well as improves the network performance. Keywords: Smart Grid, Sensor Network, High Impedance Faults, Support Vector Machine Classifier I. INTRODUCTION W



Intelligent Fault Detection and Classification Schemes ...

Effective fault detection, classification, and localization are vital for smart grid self-healing and fault mitigation. Deep learning has the capability to autonomously extract fault characteristics and discern fault categories from ...

Autonomous Smart Grid Fault Detection , PDF

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 carbon neutrality goals. 2. These factors require more accurate

real-time sensing of equipment status under variable conditions, development of condition ...

A Comprehensive Review on Fault Data Injection in Smart Grid

Due to these phenomena, more monitoring, and security processes have been adopted in smart grid to control fault data injection, cyber-attack, and physical side attackers in smart grids. This work uses data retransmission and package loss to increase the accuracy of fault data detection. WSN-featured defense in smart grid has given more

Fault Detection, Classification And Location In Power ...

Keywords: fault classification, fault detection, fuzzy logic, smart meter data, smart grid ©The Author('s). This is an open access article distributed under the terms of theCreative Commons Attribution License (CC In a smart grid, faults are detected by analyzing the shape of voltage, current and phases. That is why in [14], the authors

Making Smart Grids Smarter with Machine Learning

It fits in as the final piece of the smart grid

system which is driven by data collection, analysis, and decision making. Machine learning techniques provide an efficient way to analyze, and then make appropriate decisions to run the grid; and thus enables the smart grid to function as it is intended to. Machine learning functionalities include:

Fault Detection, Classification And Location In Power ...

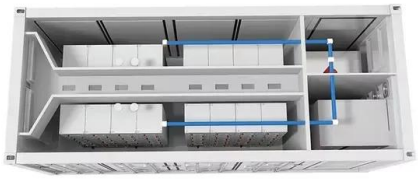
Keywords: fault classification, fault detection, fuzzy logic, smart meter data, smart grid ©The Author('s). This is an open access article distributed under the terms of theCreative Commons

Autonomous Smart Grid Fault Detection

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-

Automatic Fault Identification in WSN Based Smart Grid ...

Recent works related to fault detection in WSN based smart grid environments are mentioned . below . Arifa et al. [21] proposed a wireless sensor based smart grid by using cognitively driven load .



Huawei Unveils Top 10 Trends of Smart PV for a Greener Future

SHENZHEN, China, Dec. 26, 2022 /PRNewswire/ -- Huawei held the Top 10 Trends of Smart PV (photovoltaic) conference, with the theme of "Accelerating Solar as a Major Energy Source". At the conference, Chen Guoguang, President of Huawei Smart PV+ESS Business, shared Huawei's insights on the 10 trends of Smart PV from the perspectives of multi-scenario [...]

Anomaly Detection Techniques in Smart Grid Systems: A ...

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.

Soft computing based smart grid fault detection using ...

A smart grid of this scale can test all essential faults as well as provide dataset needed to

properly examine a fault detection system. In reality, the loading of the power system is affected by a broad variety of variables such as the surrounding temperature, solar radiation, energy stored in batteries, nonlinear load, and the performance of

Failure and fault classification for smart grids

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

GitHub

Thanks to the advancements in the field provided by the smart grid, several data-driven approaches have been proposed in the literature to tackle fault prediction tasks. Implementing these systems brought several improvements, such as optimal energy consumption and quick restoration. Thus, they have become an essential component of the smart grid.

Contact Us

For catalog requests, pricing, or partnerships, please visit: https://www.ian-solar.co.za