Fault detection in smart grid Bhutan

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 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.

Why is fault analysis important in smart power systems?
Fault analysis is essential to enhance performance and minimize interruptionsin the smart power system. It is fundamental to detect,locate,and clear faults at any power system level to keep the power system operating in normal condition. This task requires intelligent control to perform quickly and efficiently .

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.

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 ...

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 .

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 ...

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 ...

The different parts of the understudy smart grid as a sample network and the considered fault is discussed in the next section. The third section of the paper explains the proposed algorithm with details. And at the last section, a comprehensive study is done on different faults of the smart grid to prove the acceptable performance of the system.

In: 2018 IEEE power & energy society innovative smart grid technologies conference (ISGT), Washington, DC, pp 1-5. Google Scholar Jamil M, Sharma SK, Singh R (2015) Fault detection and classification in electrical power transmission system using artificial neural network. Springerplus 4:334

Real-time smart grid monitoring is critical to enhancing resiliency and operational efficiency of power equipment. Cloud-based and edge-based fault detection systems integrating deep learning have been proposed recently to monitor the grid in real time. ...

This research proposes an innovative simulation-based model for fault detection and correction in a smart grid environment by the integration of UPS (uninterrupted power supply). This ...

The area of smart power systems needs continuous improvement of its efficiency and reliability, to produce power with optimal quality in a resilient, fault-tolerant grid. Components must be highly reliable, properly maintained, and the occurrence of faults and...

Request PDF | Faults in smart grid systems: Monitoring, detection and classification | Smart Grid (SG) is a multidisciplinary concept related to the power system update and improvement. SG implies ...

This paper proposes two machine learning approaches based on the binary classification to improve the process of fault detection in smart grids. Besides, it presents four machine ...

A systematic literature review surveying 30 different faults and failures which can occur in the Smart Grid Reference Architecture Model (SGAM), providing a useful frame of reference for practitioners and researchers dealing with hardware and software dependability in this complex domain.

Fault Types Percentage Differential Relay Buchholzs Relay IDMT Our Scheme Over voltage Over current Differential Thermal o o X o o o o X o X o o X X X X 3. Conclusions In this paper, an Arduino-based fault detection and monitoring system for power transformers in the smart grid environment was introduced.

IEEE Trans. Smart Grid 12, 1939-1952 (2020). Article Google Scholar ... The proposed method, which

performs fault detection and classification together, just requires local information and ...

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-

Fault detection and identification are critical tasks in maintaining the reliability and stability of the energy grid. The timely detection of faults and accurate identification of their locations ...

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.

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 ...

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.

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 ...

This article proposes a deep learning (DL) model made of Long Short Term Memory (LSTM) and Adaptive Neuro Fuzzy Inference System (ANFIS) to detect fault in smart distribution grid assisted by...

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 ...

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