PEES Power Systems

Photovoltaic panel quality detection method

Overview

This paper presents an innovative explainable AI model for detecting anomalies in solar photovoltaic panels using an enhanced convolutional neural network (CNN) and the VGG16 architecture. The model effectively identifies physical and electrical changes, such as dust and bird droppings, and is. Photovoltaic (PV) system performance and reliability can be improved through the detection of defects in PV modules and the evaluation of their effects on system operation. In this paper, a novel system is proposed to detect and classify defects based on electroluminescence (EL) images.

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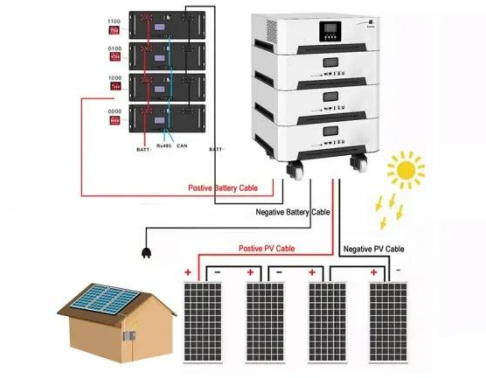
Fault Detection and Classification for Photovoltaic Panel System Using

The deployment of solar photovoltaic (PV) panel systems, as renewable energy sources, has seen a rise recently. Consequently, it is imperative to implement efficient methods for the ...

ST-YOLO: A defect detection method for photovoltaic modules based ...

Photovoltaic panels are the core components of photovoltaic power generation systems, and their quality directly affects power generation efficiency and circuit safety. To address the shortcomings of ...



A review of automated solar photovoltaic defect detection systems

This paper presents a comprehensive review of different data analysis methods for defect detection of PV systems with a high categorisation granularity in terms of types and approaches for ...

Detection and classification of photovoltaic module defects based on

Photovoltaic (PV) system performance and reliability can be improved through the detection of defects in PV modules and the evaluation of their effects on system operation. In this ...

A novel deep learning model for defect detection in photovoltaic ...

To address the current limitations of low precision and high image data requirements in defect detection algorithms based on visible light imaging, this paper proposes a novel visible light ...

Enhanced Fault Detection in Photovoltaic Panels Using CNN-Based ...

Regular maintenance and inspection are vital to extend the lifespan of these systems, minimize energy losses, and protect the environment. This paper presents an innovative explainable ...

A Photovoltaic Panel Defect Detection Method Based on the Improved

Aiming at the current PV panel defect detection methods with insufficient accuracy, few defect categories, and the problem that defect targets cannot be localized, this paper proposes a PV panel ...

Advanced deep learning modeling to enhance detection of defective

This paper discusses a deep learning approach for detecting defects in photovoltaic (PV) modules using electroluminescence (EL) images.

Defect analysis and performance evaluation of photovoltaic modules

Currently, three main technologies are used to detect defects in PV cells: electroluminescence (EL), infrared thermography (IRT), and photoluminescence (PL). EL is a ...

Enhanced photovoltaic panel defect detection via adaptive

To objectively assess the effectiveness

of our proposed method for photovoltaic panel defect detection, we conducted both quantitative and qualitative comparisons against established

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