

This paper develops an automatic defect detection mechanism using texture feature analysis and supervised machine learning method to classify the failures in photovoltaic (PV) modules. The proposed technique adopts infrared thermography for identifying the anomalies on PV modules, and a fuzzy-based edge detection technique for detecting the ...

PDF | On Feb 1, 2020, Imad Zyout and others published Detection of PV Solar Panel Surface Defects using Transfer Learning of the Deep Convolutional Neural Networks | Find, read and cite all the ...

These methods utilize computer vision, image processing, and data analysis techniques to enable the detection and classification of PV panel defects in an efficient and accurate manner at the same time.

In the identification of PV panel defects, in an effort to reflect the influence of different improvement strategies on the accuracy of detection of surface defects on PV panels, an ablation experiment was carried out, and the experimental results are presented in Table 2. Compared with the YOLOv5s model, the optimization model has the following indicators: the ...

For the defect detection of solar panels, the main traditional methods are divided into artificial physical method and machine vision method. Byung-Kwan Kang et al. [6] used a suitable temperature control procedure to adjust the relationship between the measured voltage and current, and estimated the photovoltaic array using Kalman filter algorithm with a ...

The maintenance of large-scale photovoltaic (PV) power plants is considered as an outstanding challenge for years. This paper presented a deep learning-based defect detection of PV modules using electroluminescence images through addressing two technical challenges: (1) providing a large number of high-quality Electroluminescence (EL) image generation ...

Abstract: Photovoltaic (PV) panel surface-defect detection technology is crucial for the PV industry to perform smart maintenance. Using computer vision technology to detect PV panel surface defects can ... o By comparing this method with five state-of-the-art methods, the proposed PV panel surface defect approach has improved the mAP by at ...

The traditional methods for detecting defects in PV panels, such as visual inspection, infrared (IR) thermography, Canny and Sobel edge detection operator, and electrical testing, have been widely used in practical applications. However, these methods have some limitations, such as the relatively single type of faults detected and insufficient sensitivity to tiny ...

Defects of solar panels can easily cause electrical accidents. The YOLO v5 algorithm is improved to make up for the low detection efficiency of the traditional defect detection methods. Firstly, it is improved on the basis of coordinate attention to obtain a LCA attention mechanism with a larger target range, which can enhance the sensing range of target features ...

INTRODUCTION: Research on intelligent defect detection technology using machine vision was conducted to address the challenging problem of detecting and localizing PV defects in photovoltaic power ...

Early and effective surface defect detection in industrial components can avoid the occurrence of serious safety hazards. Since most industrial component surfaces have tiny defects with high ...

Dust detection in solar panel using image processing techniques: A review ... soil and dust on PV surface. The method is based on features extraction using Gray Level Co- ... defect detection ...

Photovoltaic (PV) cell defect detection has become a prominent problem in the development of the PV industry; however, the entire industry lacks effective technical means. In this paper, we propose a deep ...

Photovoltaic (PV) panels are prone to experiencing various overlays and faults that can affect their performance and efficiency. The detection of photovoltaic panel overlays and faults is crucial for enhancing the performance and durability of photovoltaic power generation systems. It can minimize energy losses, increase system reliability and lifetime, and lower ...

This paper takes PV defect detection as the center of the discussion. First of all, the common photovoltaic defect detection methods are analyzed and discussed, and then further control verification is done through simulation experiments to compare the advantages and disadvantages of different detection methods. 2. Image Processing-Based Detection

A photovoltaic surface defect detection method for building based on deep learning. Author links open overlay panel Yukang Cao a, Dandan Pang a, Yi Yan a, Yongqing Jiang b, ... Tommaso et al. [19] proposed the detection of panel defects on photovoltaic aerial images based on the YOLO-v3 algorithm and computer vision techniques, which ...

Web: <https://www.arcingenieroslaspalmas.es>