

To objectively assess the effectiveness of our proposed method for photovoltaic panel defect detection, we conducted both quantitative and qualitative comparisons against established techniques ...

The two panel detection methods are highly effective in the presence of complex backgrounds. Keywords: solar panel detection; solar panel projection; texture descriptor; support vector machine; deep learning; NIR; thermal imaging 1. Introduction The increased use of renewable and low-carbon energy has led to economic [1] and environmental ...

The deep-learning-based methods usually follow the development of neural network architectures. Malof et al. [76] have explored the performance of the visual geometry group network (VGGNet) for PV panel detection. Camilo ...

The dataset of 2,542 annotated solar panels may be used independently to develop detection models uniquely applicable to satellite imagery or in conjunction with existing solar panel aerial ...

Based on the gathered information, artificial intelligence, visual and thermal method, electrical based method dominated other techniques in terms of accuracy, the ...

The results indicate that the proposed model is highly effective, achieving a detection accuracy of 99.02% and a precision of 91.67% in identifying and localizing hotspots on solar PV panels. In [73], physics-based simulations of string-level I-V curves were used to detect three statuses of solar PV modules: no faults, partial soiling, and cell crack system modes.

Zyout I, Oatawneh A. Detection of PV solar panel surface defects using transfer learning of the deep convolutional neural networks[C]//2020 Advances in Science and Engineering Technology International Conferences (ASET). ... Ruan C, Tang W, Hu X, Deep Learning-based Method for PV Panels Segmentation and Defects Detection with Infrared ...

This paper presents an innovative explainable AI model for detecting anomalies in solar photovoltaic panels using an enhanced convolutional neural network (CNN) and ...

The maturity of solar technologies has also led to a decrease in the cost of solar energy, making it more competitive with other energy sources. As a result, there is a growing need for efficient methods for detecting and mapping the locations of PV panels. Automated detection can in fact save time and resources compared to manual inspection.

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 ... and sparse features. At present, it is widely used in the defect detection process of solar panels, especially in the detection accuracy and inference speed of the model. In terms of model ...

While solar energy holds great significance as a clean and sustainable energy source, photovoltaic panels serve as the linchpin of this energy conversion process. However, ...

With the deepening of intelligent technology, deep learning detection algorithm can more accurately and easily identify whether the solar panel is defective and the specific ...

The fault detection and classification model reported in utilizes thresholding method and fuzzy logic classifier for solar PV panel's fault detection. Considering the thresholding level fixed, the initial level fault detection is performed.

Moreover, imaging spectroscopy data has been utilized to detect PV solar panels, which differentiate ground objects based on their reflection characteristics and can enhance the accuracy of existing methods for various detection angles [36]. Nonetheless, the utilization of imaging spectroscopy for PV detection is subject to certain limitations, such as ...

The extraction of photovoltaic (PV) panels from remote sensing images is of great significance for estimating the power generation of solar photovoltaic systems and informing ...

Shin et al. 23 developed a solar distribution panel anomaly detection system using thermal ... This paper proposes a novel PV defect detection method using attention mechanisms and transformers ...

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