Photovoltaic panel infrared detection time

Overview

The experimental results show that the optimized Deeplabv3+ model and YOLO v5 model improve the accuracy of segmenting PV panels in images and identifying hot-spot defects by 2. 7%, respectively, compared with the original model. Abstract-Utility-scale solar arrays require specialized inspection methods for detecting faulty panels. Photovoltaic (PV) panel faults caused by weather, ground leakage, circuit issues, temperature, environment, age, and other damage can take many forms but often symptomatically exhibit temperature . Aiming at the problem of difficult operation and maintenance of PV power plants in complex backgrounds and combined with image processing technology, a method for detecting hot spot defects in infrared image PV panels that combines segmentation and detection, Deeplab-YOLO, is proposed. In the PV . To address the challenges of high missed detection rates, complex backgrounds, unclear defect features, and uneven difficulty levels in target detection during the industrial process of photovoltaic panel defect detection, this article proposes an infrared detection method based on computer vision . Experiments on a self-built photovoltaic array infrared defect image dataset show that ST-YOLO, compared to the baseline YOLOv8s, achieves a 15% reduction in model weight, a 2. 9% improvement in Precision, and a 1. A dataset comprising 20,000 images, derived from .

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Intelligent monitoring of photovoltaic panels based on infrared detection

To date, some methods have been developed to meet this purpose. However, to date, a satisfactory solution has not been achieved for managing large-scale solar PV power plants. To

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

This module reduces the computational burden of model parameters and improves detection speed through lightweight design. Additionally, the Triplet Attention mechanism is

PeerJ Photovoltaic panel defect detection algorithm based on infrared

To address these limitations (Hussain & Khanam, 2024), this study proposes a PV panel defect detection method based on YOLOv8 and computer-based infrared vision. We modify the

Deeplab-YOLO: a method for detecting hot-spot defects in infrared

Aiming at the problem of difficult operation and maintenance of PV power plants in complex backgrounds and combined with image processing technology, a method for detecting hot

Infrared Computer Vision for Utility-Scale Photovoltaic Array

Among these, infrared thermography cameras are a powerful tool for improving solar panel inspection in the field. These can be combined with other technologies, including image processing and machine

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

Although these technologies have good detection performance, they are relatively complex and time-consuming to operate. The visual inspection method is the most convenient and quick method; it only

[A Lightweight Model for Infrared Photovoltaic Panel Defect Detection]

In this study, a lightweight real-time detection model, TA-YOLOv11, is proposed for UAV-based IR PV panel defect identification.

[Accurate detection of photovoltaic panel defects via visible-infrared]

Timely automated detection is crucial for maintaining power generation efficiency and ensuring equipment safety. This paper presents a lightweight enhanced YOLOv11n model for

[Fault Detection in Solar Energy Systems: A Deep Learning Approach]

This study explores the potential of using infrared solar module images for the detection of photovoltaic panel defects through deep learning, which represents a crucial step toward

[Infrared Thermal Images of Solar PV Panels for]

Fault Identification

Solar PV plants, both ground mounting and the rooftop, are mushrooming thought the world. One of the significant challenges is the fault identification of the solar PV module, since a vast

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