

How fast does RCNN detect photovoltaic panels?

In terms of the speed of model detection, the two-stage Faster RCNN lagged far behind the one-stage object detection algorithms in the detection speed of photovoltaic panels. The FPS of the improved algorithm in this paper reached 49, meeting the requirements of real-time detection.

Is a new model suitable for real-time photovoltaic panel hot-spot fault detection?

A comprehensive comparison of the accuracy, detection speed, and model parameters of each model showed that the indicators of the new model are superior to other detection models; thus, the new model is more suitable to be deployed on the UAV platform for real-time photovoltaic panel hot-spot fault detection.

1. Introduction

How do UAVs detect photovoltaic panels?

UAVs (UAVs) equipped with multispectral cameras for thermal spot detection of photovoltaic panels. The process begins with UAV aerial photography of the photovoltaic power plant, capturing both visible and infrared images. The v

Can photovoltaic panels detect hot-spot faults?

The research on hot-spot fault detection of photovoltaic panels can be roughly divided into two directions: using the electrical characteristics of photovoltaic panels and using the infrared image characteristics of photovoltaic panels [7, 8].

Thermal radiation can be used to detect defects in photovoltaic panels, allowing for the rapid identification of problem areas, which makes this method especially suitable for large-scale ...

These results validate the effectiveness of PV-YOLOv12n in detecting critical PV panel defects, supporting its deployment in large-scale solar farm inspections.

This paper aims to evaluate the effectiveness of two object detection models, specifically aiming to identify the superior model for detecting photovoltaic (PV) modules based on aerial images.

red thermography system designed specifically for rapid fouling detection on large-scale PV panels. This system preprocesses infrared images using a K-nearest neighbor mean filter and ...

With recent significant achievements and growth of machine learning methods in image processing and technical diagnosis, it is greatly possible to develop a machine learning model to ...

In this paper, PV-YOLO is proposed to replace YOLOX's backbone network, CSPDarknet53, with a transformer-based PVTv2 network to obtain local connections between ...

The existing hot-spot fault detection methods of photovoltaic panels cannot adequately complete the real-time

detection task; hence, a detection model considering both detection accuracy ...

To address this issue, this paper proposes a method and system for hot spot detection on photovoltaic panels using unmanned aerial vehicles (UAVs) equipped with multispectral cameras.

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

Latoui et al. proposed a low-cost system for real-time detection of partial shading in PV panels. Using AlexNet CNN with 2D scalograms, it achieves 98.05 % accuracy.

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