UAV detection of photovoltaic panels

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

To address these challenges, we propose the real-time photovoltaic YOLO network (RTPV-YOLO), specifically designed for real-time PV defect detection using UAVs.

The UGV, equipped with a YOLOv5-based computer vision system, performs cable detection and ground-level navigation. At the same time, the UAV focuses on aerial inspection tasks ...

This paper provides an in-depth literature review on image processing techniques, focusing on deep learning approaches for anomaly detection and classification in photovoltaics.

Although real-time UAV-based deployment was not conducted, a mission planning framework was proposed. These results highlight DCD-YOLOv8s"s strong potential for integration ...

manual inspection methods highly inefficient and inadequate for modern photovoltaic power stations. To address this issue, this paper proposes a method and system for hot spot detecti. n on photovoltaic ...

When detecting infrared photovoltaic panel images taken by UAV, the lightweight deep learning method can not only improve the robustness and accuracy of hotspot detection in a complex ...

The use of thermal imagery and UAVs has become increasingly common for detecting faults in solar panel systems, particularly in large-scale arrays where traditional electrical methods are difficult to ...

A custom dataset, annotated in the COCO format and specifically designed for solar panel defect and contamination detection, was developed alongside a user interface to train and evaluate the models.

The growing reliance on photovoltaic (PV) systems as a sustainable energy source is challenged by

performance degradation due to faults, necessitating efficient fault detection methods. ...

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