

Title: UAV detection of photovoltaic panels

Generated on: 2026-04-22 01:56:18

Copyright (C) 2026 Republic GmbH. All rights reserved.

For the latest updates and more information, visit our website: <https://www.nerdrepublish.co.za>

-----

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 detection 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



# UAV detection of photovoltaic panels

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

Web: <https://www.nerdpublic.co.za>

