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UAV photovoltaic panel inspection algorithm

This article presents a novel autonomous inspection framework for PV installations using on-board electronics of PV panels (IoT Modules) and a UAV fleet. The IoT Modules are in charge of ...

Key innovations discussed include advanced machine learning algorithms and specialized imaging techniques, such as thermal, visual, and electroluminescence (EL) imaging, selected for their ...

It examines key components of UAV-based PV inspection, including data acquisition protocols, panel segmentation and geolocation, anomaly classification, and optimizations for model ...

This paper aims to design and fabricate a prototype of a solar-powered, fixed-wing, Unmanned Aerial Vehicle (UAV) with energy harvesting capabilities that can inspect and monitor ...

In this article, a hot spot defect detection algorithm according to infrared images of aerial PV is proposed for practical engineering problems such as defects with different morphology, unclear ...

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

Our system employs a dynamic online planning algorithm that allows for real-time task allocation and inspection on a per-panel basis. In this paper, we propose a new approach where each panel is ...

The RTPV-YOLO algorithm is designed to work with UAV platforms, which are equipped with thermal and RGB cameras for data collection during PV panel inspections.

In this paper, we presented a comprehensive, integrated framework for UAV-based PV inspection that successfully addresses the critical challenges of representation robustness, multi ...

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.

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