Photovoltaic panel surface contamination inspection method

To enable accurate detection of surface contamination and defect for autonomous cleaning robot, a PV-YOLOv8n-based detection method for photovoltaic surface, built upon a small-sample ...

To significantly enhance the accuracy and real-time performance of photovoltaic panel defect detection, thereby providing strong technical support for the intelligent operation and ...

These methods significantly enhance image processing workflows, facilitating more accurate and efficient defect detection on solar panel surfaces. Al-Otum [10] developed a sophisticated deep ...

Photovoltaic power generation is an important part of the development of green energy, and the dust deposited on the surface of photovoltaic panels can affect t

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 calculation method of photovoltaic cell surface fouling proposed in this study can effectively reflect the power change of photovoltaic panels, and can be used as one of the...

In this article, an integrated survey of 1) possible factors of dust accumulation, 2) dust impact analysis, 3) mathematical model of dust accumulated PV panels, and 4) proposed cleaning...

To address this, we propose an enhanced U-Net-based deep learning model for accurately identifying surface deposits on PV panels. Our method employs a two-stage semantic ...

As the photovoltaic (PV) industry continues to evolve, advancements in Photovoltaic panel surface contamination inspection method have become critical to optimizing the utilization of renewable ...

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Based on the experiences of the aforementioned researchers and the summary of existing photovoltaic module defect detection methods, this paper proposes ST-YOLO, specifically ...

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