Photovoltaic energy storage defect detection

In order to tackle this issue, this study presents a PV panel defect detection approach based on the advanced YOLOv11 object detection algorithm. The mosaic augmentation approach is first employed ...

Automated defect detection in electroluminescence (EL) images of photovoltaic (PV) modules on production lines remains a significant challenge, crucial for replacing labor-intensive and...

Targeting the poor precision, limited real-time and high model complexity of defects and exotic objects detection in solar photovoltaic panels, a new intelligent detection algorithm, SPP ...

To address these challenges, there is a need to improve the reliability of monitoring systems designed to detect defects and ensure energy production efficiency, avoiding energy ...

This study explores the use of convolutional neural networks (CNNs), including Alex Net, Squeeze Net, and ResNet18, to identify and categorize defects utilizing the PVEL-AD dataset.

The adoption of each of the reviewed techniques depends on several factors, including the deployment scale, the targeted defects for detection, and the required location of defect analysis in ...

Given the characteristics of photovoltaic power plants, deep learning-based defect detection models can be deployed on surveillance systems or drone patrols, enabling automated ...

Photovoltaic (PV) system performance and reliability can be improved through the detection of defects in PV modules and the evaluation of their effects on system operation. In this ...

We evaluate the robustness and generalization of YOLOv8-DG using a public photovoltaic electroluminescence defect detection dataset and two self-created PV cell datasets, achieving 89.5% ...

This study not only offers a new, efficient, and accurate approach for PV defect detection but also provides strong technical support for intelligent operation and maintenance as well as quality ...

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