

Photovoltaic panel crack identification

How can a solar panel crack be detected?

Tsuzuki K et al. proposed to use the relationship between the voltage and current obtained on a specific semiconductor after a bypass diode or solar cell element was supplied with forward current or voltage to enable the detection of its defects. Esquivel used contrast-enhanced illumination to detect solar panel crack defects.

What is PVL-AD dataset for photovoltaic panel defect detection?

To meet the data requirements, Su et al. 18 proposed PVEL-AD dataset for photovoltaic panel defect detection and conducted several subsequent studies 19,20,21 based on this dataset. In recent years, the PVEL-AD dataset has become a benchmark for photovoltaic (PV) cell defect detection research using electroluminescence (EL) images.

What is PV panel defect detection?

The task of PV panel defect detection is to identify the category and location of defects in EL images.

Can EL images be used for photovoltaic panel defect detection?

Buerhop et al. 17 constructed a publicly available dataset using EL images for optical inspection of photovoltaic panels. Based on this dataset, researchers have developed numerous algorithms 9,10,12 for photovoltaic panel defect detection.

Can a real-time defect detection model detect photovoltaic panels?

Efforts have been made to develop models capable of real-time defect detection, with some achieving impressive accuracy and processing speeds. However, existing approaches often struggle with feature redundancy and inefficient representations of defects in photovoltaic panels.

Is Yolo-ACF a good choice for defect detection on photovoltaic panels?

Through qualitative and quantitative comparisons with various alternative methods, we demonstrate that our YOLO-ACF strikes a good balance between detection performance, model complexity, and detection speed for defect detection on photovoltaic panels. Moreover, it demonstrates remarkable versatility across a spectrum of defect types.

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