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Photovoltaic panel dust detection algorithm

Overview

The methodology involves several key steps: first, using the YOLO11-OBB rotating object detection algorithm to accurately extract photovoltaic strings and individual solar panels from both visible light and thermal imaging images; second, applying the YOLO11-SEGMENT algorithm to. The methodology involves several key steps: first, using the YOLO11-OBB rotating object detection algorithm to accurately extract photovoltaic strings and individual solar panels from both visible light and thermal imaging images; second, applying the YOLO11-SEGMENT algorithm to. This study proposes SolPowNet, a novel Convolutional Neural Network (CNN) model based on deep learning with a lightweight architecture that is capable of reliably distinguishing between images of clean and dusty panels. The performance of the proposed model was evaluated by testing it on a dataset. To address these limitations, I propose a novel dust detection method that integrates deep learning with traditional image processing techniques. This approach leverages the YOLO11 algorithm for robust feature extraction and generalization, combined with histogram analysis and dual-light image. In this work, we are more concerned with the detection of dust from the images of the solar panels so that the cleaning process can be done in time to avoid power loses due to dust accumulation on the surface of solar panels. To this end, we utilize state-of-art deep learning-based image.

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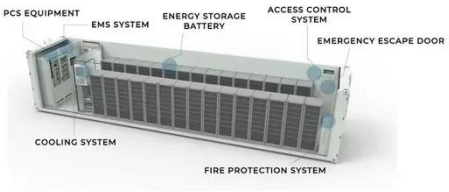

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