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DEFECT DETECTION OF PHOTOVOLTAIC PANELS USING MATHEMATICAL AND DEEP LEARNING MODELS

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**Abstract:** Convolutional neural networks (CNNs), the most popular type of Deep learning (DL) algorithms, applied to detect photovoltaic (PV) defect detection. Environmental situations consider different defects like a spotlight, crack, dust, and micro-cracks to detect the defects as well as localize the defects. However, the visual check of the panels takes a lot of time and causes high economic costs. Today, the number of robotic systems is increasing, and they are used for different purposes with the development of technology. To help with the timely maintenance and repair of photovoltaic systems, AI-based drones can facilitate the complicated and time-intensive control process for detecting healthy and defective solar panels. In the test phase, the input image has been applied with different operations, and the features extracted have passed through the model trained. This method identifies the class of defect and localizes the defect in the image. The proposed model produces efficient results in identifying solar plate defect detection.

**Keywords:** Defect detection Photovoltaic Panels, CNN Models,

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