Design of dust removal control system for photovoltaic panels

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Abstract: This paper describes the development of an automated dust detection and cleaning system which could be used to clean photovoltaic (PV) modules.

This review examines the impact of dust on PV performance and evaluates cleaning approaches, including electrostatic removal, super hydrophobic and super hydrophilic coatings, surface acoustic ...

The primary focus of this study was the development of a solar panel cleaning machine intended for the maintenance of photovoltaic solar panels after their installation.

The functional PV system can work automatically and can deliver input of occurrence of detecting water and dust. we will address the technique, approach, and framework design of the cleaning and ...

The proposed system employs sensor-based dust monitoring and a Predictive Reflex control architecture implemented on an Arduino Uno microcontroller, activating an air-fan-based cleaning ...

The increasing reliance on solar power systems as a sustainable and renewable energy source necessitates maintaining optimal performance, which can be hindered

This paper reviews electrodynamic dust shield (EDS) systems used to mitigate dust adhesion and accumulation on optical elements, such as photovoltaic (PV) panels.

This review consolidates four decades of research (1983-2024) on dust mitigation for photovoltaic systems, categorizing strategies into four key areas: preventive measures, dust ...