

Automatic Solar Panel Cleaning System

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Abstract: Solar power is mainly harnessed from photovoltaic (PV) panels which are arranged in multiple arrays in a solar farm or solar system. Though, power generation from PV solar system is characterized by uncertain efficiency, many countries with high insolation prefer solar as an alternative way of generating clean energy. However, the efficiency of energy generated from PV panels is affected by the accumulation of dust and debris, even on one panel in an array. This condition leads to the need for regular cleaning of the surface of PV panels. Current labor-based cleaning methods for photovoltaic arrays are costly in time, water and energy usage as well as lacking in automation capabilities. To overcome this problem, a fully automatic solar panel cleaning system with/without water is proposed. Hence, in this paper, the design of a robot for automated cleaning of the surface of PV panel is presented. The design utilizes an Arduino controller system to control the robot movement during the cleaning process. In addition, it is equipped with two rough sponge and a water pump system that can be used to clean dust or debris found on PV panel surfaces. The efficiency of the PV panels before and after the cleaning process is also observed.

Keywords: Arduino nano, Bluetooth Module, PV Panel, Brush.

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