

Automatic Photovoltaic Solar Panel Dust Cleaning System

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Abstract: Renewable energy sources are currently regarded as viable options for stabilizing the energy crisis globally as well as addressing global warming challenges. Solar energy is the most promising and sustainable energy source as compared to other renewable energy sources such as coal, nuclear, wind, gas, and hydro energy. The increasing demand for solar panels should be reason enough to investigate ways in which we can increase their efficiency as much as possible. Dust, dirt, and bird dropping are major factors that can affect the performance of solar panel systems. This work presents the development of a solar panel cleaning system that automatically detects dust particles and cleans the solar panel to ensure the continues efficiency of the solar system is at an optimal level. The system comprises of five subsystems: dust sensing, water pumping, microcontroller, cleaning mechanism, and the power system. Tests carried out on the system shows its quick response to signals and effectiveness in cleaning the solar panel whenever dust particles are detected.

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