Conference Abstract

Design and Improving the Mechanical performance of Dual axis Solar Tracker using LDR Sensors

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Abstract

A solar tracking system which carries solar panels, maximizes the solar electricity production by moving panels to follow the sun throughout the day. In this work, a small solar tracking system was developed by using Arduino UNO, light dependent resistances (LDR) and servo motors. Four LDRs are placed in a specially designed cross walls to receive different intensities of light by shadowing them while they are not facing directly perpendicular to the sun. Each LDR send an equivalent signal of their respective resistance value to the Microcontroller which is configured by required programming logic. The values are compared with each other by considering a particular LDR value as a reference. These variation in values are used as triggers to rotate servo motors. Pair of servo motors are mechanically attached with the driving axis of the other one so that the former move with the rotation of the axial of the latter one. The axial of the former servo motor was used to drive a solar panel. These two-servo motors are arranged in such a way that the solar panel can move along X-axis as well as Y-axis to face the Sun perpendicularly. The cooling system was also developed in such a way when the temperature of the solar panel surface above 44°C the water pumping motor starts to spray water until the temperature drops to 36°C. The output power of silicon solar cell with surface area 0.189 m^2 was measured with its corresponding angle for a day in December starting from 6 am to 6pm. The best Sun facing angle was found to be around 35°.

Keywords: Solar cell, Solar tracker, Energy, Arduino