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Highly Efficient Hybrid multi Axis Sun Tracking System for PV Power Stations

Md Affan Khan¹, Syed Danish Pasha², Joshi Manohar V³

1. Electrical & Electronics Department; Presidency University; Bangalore India.

2. Computer Science Department Presidency University Bangalore; India.

3. Associate Professor and HoD Electrical & Electronics Department Presidency University; Bangalore; India.

Abstract

The light, which is an inexhaustible source of solar energy, radiates solar energy, which is also considered green energy. The efficient collection of renewable energy from the photovoltaic solar cells (PV cells). In real-time, the location of the sun in the sky is constantly varying from time to time. The production of PV cells is strongly dependent on the light intensity of the sun, a basic reason for a typical PV cell to become low. Various control processes such as static solar trackers, single-axis solar trackers and dual axis solar trackers are present in the literature. This paper presents the design and construction of a cost-effective active dual-axis solar tracking system for tracking the movement of the sun to get maximum power from the solar panels as they follow the sun. The code has been developed using C++ programming language and targeted to Arduino UNO microcontroller. The performance of the Single-axis tracker was analysed and compared with the Dual-axis tracker and the proposed method is validated with the experimental approach and better results were obtained in dual-axis solar tracking with 14% more power gain compared to single-axis solar tracking

Keywords:

Solar energy, Dual-axis solar tracker, Photovoltaic Panel, Light Dependent Resistor, Arduino Uno, Servo Motors.

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