IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, March 2026
Impact Factor: 8.2

Sun Tracking Solar Panel Using Arduino

Munde Samiksha Dnyaneshwar[1], Patil Shrushti Jaipal[2], Tadke Janhvi Jaipal[3], Mr. Kazi A. S. M[4]
[123]Students, Diploma in Computer Engineering
[4]HOD, Diploma in Computer Engineering
Vishweshwarayya Institute of Engineering and Technology, Almala, Maharashtra, India

Abstract: *A Sun Tracking Solar Panel system is designed to improve the efficiency of solar energy generation by continuously aligning the solar panel with the direction of maximum sunlight. Traditional fixed solar panels receive sunlight at varying angles throughout the day, resulting in reduced energy output. This project utilizes an Arduino-based control system to automatically track the sun's movement from east to west.*

The system employs light-dependent resistors (LDRs) to detect the intensity of sunlight and determine the optimal orientation of the panel. Based on the sensor inputs, the Arduino microcontroller processes the data and drives servo or DC motors to adjust the panel's position accordingly. This real-time tracking mech-anism ensures that the panel remains perpendicular to sunlight, thereby maximizing energy absorption.

The proposed system is cost-effective, energy-efficient, and suitable for both small-scale and large-scale solar applications. Experimental results demonstrate a significant increase in power output compared to stationary panels. This project highlights the potential of embedded systems in enhancing renewable energy technologies and contributes to sustainable power generation.

Keywords: Solar Energy, Sun Tracking System, Arduino, Renewable Energy, Light Dependent Resistor (LDR), Servo Motor, Embedded Systems, Automatic Solar Tracker, Photovoltaic System, Energy Efficiency Microcontroller, Sustainable Energy, Real-Time Tracking, Dual Axis / Single Axis Tracking

DOI: 10.48175/IJARSCT-31904