In this project, we are going to show you how to make an Arduino Based Solar Tracker Using LDR & Servo Motor. The Solar Panel Tracker is designed to follow the sun movement so that maximum light intensity hits on the solar panel, thus increasing the power efficiency.

We have designed a single-axis solar tracking system. In this system, the whole solar panel moves from east to west in a day to point in the direction of the sun. The use of a solar tracker circuit in the field of energy production will increase its efficiency. This system can also be successfully implemented in other solar energy-based projects like water heaters and steam turbines.

1: Identifying features:

It is a dual-axis solar tracker that **can rotate automatically to track the sun's position using** LDR sensors, or manually by the user through the dashboard of an IoT application. The system starts with detects the sun position (intensity of light) by LDR sensors and sends the data to the controller (Arduino Mega board)

2: State of art/Research:

Solar Systems Usa - Quick And Easily Found At Asksly! Many Products. Easy Acces. Quick Results. Compare Products. Search and Discover. Find Easily. Types: Products Online, Instant Results, Big Variaty, 24/7 Accessible.

3. 4W's 1-H

Therefore, the **need** to improve the energy efficiency of PV **solar panel** through building a **solar tracking system** cannot be overemphasized.

4: High level requirements as per template:

wo LDR's (Light Dependent Resistor) LDR1 & LDR2 are connected to Analog pins of the Arduino. A solar plate is attached in parallel to the axis of the servo motor and both the sensors are kept on the solar plate as shown in the figure aboveThe design & the arrangement is done in such a manner that the movement of the sun is from LDR1 to LDR2, as shown in the image below.

5: Low level requirements as per template:

The proposed test bench is presented in Fig. 1. It is based on a solar tracker that can rotate automatically to track the sun with the help of four LDR sensors and two servomotors (SM1 and SM2), or manually using a potentiometer. To switch between the two modes (automatic and manual), a push-button is used. Another push-button is used to link either the SM1(up-down servomotor) or SM2 (left-right servomotor) to the potentiometer to control their movement. Moreover, a computer is used as a virtual instrument to visualize the mode and current, voltage and power of the PV panel according to time in MS Excel. Arduino Uno board is utilized to implement all software requirements of the system.

6;Best method followed:

Solar Tracking System - an overview | ScienceDirect TopicsWith **solar** tracking technology, the annual **solar** irradiation intensity of regions with average **solar** resources can be improved from 1200 kWh/m 2 to 1500 kWh/m 2. While this technology has been maturely applied in France, the control technology of the tracking system is still complicated and costly. The utilization efficiency and economics of **solar** energy can be significantly improved when low-cost **solar** tracking systems become available for commercial application.

This solar tracker system uses the Arduino UNO board, a servomotor, 2 LDRs and 2 resistors to rotate the solar panel towards the Sun or a source of light.
Here **https://www.electroschematics.com/8019/diy-solar-tracker-system/** you can find the version with DC motors, but without Arduino.

I have a standard servo that can rotate approximately 180 degrees (90° in each direction) and is controlled using the included Arduino's Servo Library. The code is simple too and I'll try to explain it after this video where I made a short presentation of the project in action. Unfortunately I had no solar panel at that moment.