**DUAL AXES SOLAR PANEL**

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We know that the sun is always changing its position with respect to the Earth. But conventional solar panel are fixed at a particular angle. So, their efficiency is reduced significantly in the terms of absorbing the sunlight.

To increase the efficiency of common solar panel by at least 30%, they can be made movable in either one axis or two axes to track the sun. In **India** there is already single axis solar tracker system exist. But till now dual axis solar tracker system is not there, so we have created a small model for that.

**Materials use in this model**

1. LDR (5-pics)
2. Solar panel (Mini)
3. Servo motor (2-pics)
4. Arduino UNO (ATmega328p)
5. Jumper wires
6. Normal wires
7. Power supply
8. Sun board for body
9. Programming skills

**How it works?**

This tracking system has the 2 axes, means 2-Dimentinal, that is set on two rotating axes to derive a proper angle that can help them get the maximum sunlight.

At first we are adjusting the surface of solar panel by rotating it around both the axes, it can be called “Dual Axis solar tracker”.

Then after every 20 minutes the same process will pe procced for re-positioning of solar panels.

**Advantages:**

1. Dual/double axis solar tracking system will track the sun from East to West as well as from North to South.
2. This tracking system is cheap and very simple to set up.
3. Double axes tracker suit companies that want a low-cost option and value for money
4. They will also fit for all areas where the sun light intensity is very less
5. The effectiveness of double axes solar tracker over fixed solar tracking mount system is 32% approx.

**Future improvement:**

1. Implement more advanced tracking algorithms for increased accuracy.
2. Integrate real-time clock (RTC) module for precise time-based tracking.
3. Incorporate wireless communication for remote monitoring and control.
4. Enhance the system to withstand adverse weather conditions.

**Conclusion:**

The Dual Axis Solar Tracker project demonstrates how a system can automatically orient a solar panel to maximize its exposure to sunlight. This enhances the panel's energy production and overall efficiency, making it a valuable addition to solar energy systems.

**Reference:**

1. Arduino.cc
2. Servo library
3. Online documentations