
Dual Axis Solar Tracker Project with Arduino Uno

Objective:

Automatically adjust the position of a solar panel in both horizontal and vertical directions to track the sun and maximize energy collection.

Components Required:

- Arduino Uno
- 4 LDRs (Light Dependent Resistors)
- 2 Servo motors (for horizontal and vertical movement)
- Resistors for LDR voltage dividers
- Solar panel (small for demo)
- Breadboard & jumper wires

Circuit Overview:

- 4 **LDRs** are placed around the panel (top-left, top-right, bottom-left, bottom-right) to detect sunlight intensity from different angles.
- The Arduino reads the light levels from each LDR through analog pins.
- 2 **Servo motors** are used to tilt the panel:
 - One for **horizontal (azimuth)** movement
 - One for **vertical (elevation)** movement
- Based on light difference, Arduino adjusts servo angles to align the panel towards the brightest direction.

Working Principle:

- The system compares light intensity from LDRs.
- If light is stronger on one side, the Arduino moves the panel in that direction.
- This continues throughout the day for optimal solar tracking.

Use Cases:

- Increases solar panel efficiency

- Useful in renewable energy projects
 - Great for learning sensors, actuators, and automation with Arduino
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