

EW-Project Report

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1. Project Statement:

- Solar Energy is the best resource to produce electricity without disturbing the nature with low maintenance and low costs
- The main problem is, Since the Sun direction changes in a day and the solar panel faces only one direction the solar panel cannot capture the Highest number of photons this makes us to lose the most amount of energy
- Now we want to track the sun with the solar panel by which we can get the most amount of energy

2. Aim of the project:

- The main aim of the project is make the solar panel to track the sun from which we get the highest amount of energy without any loss of solar energy
- We use the Light detecting sensors which are sensitive to light and easily detect the sunlight and makes to move the solar panel in the direction of the sun

3. Components used:

Hardware:

1. Solar panel
2. LDR sensors
3. Cardboard sheets
4. Arduino
5. Jumper Wires
6. Servo motor

Software:

1. Arduino IDE app.

4. Circuit Schematics and process Diagrams:

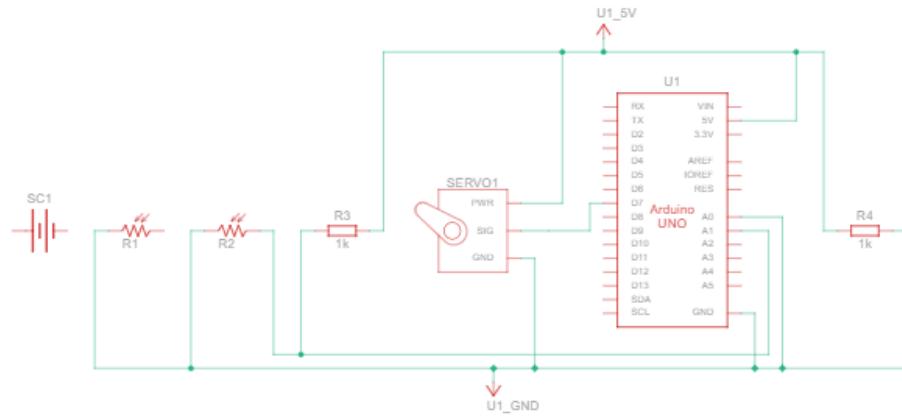


fig-01: Circuit schematics

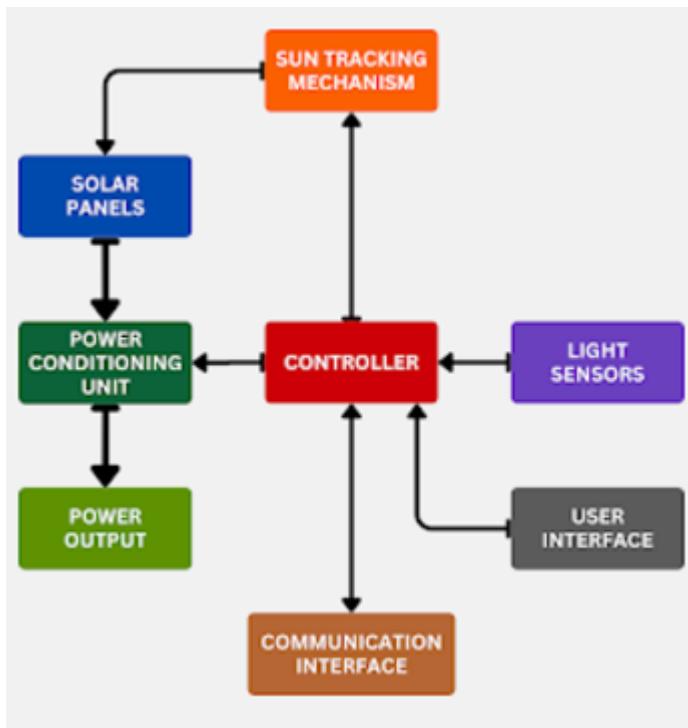
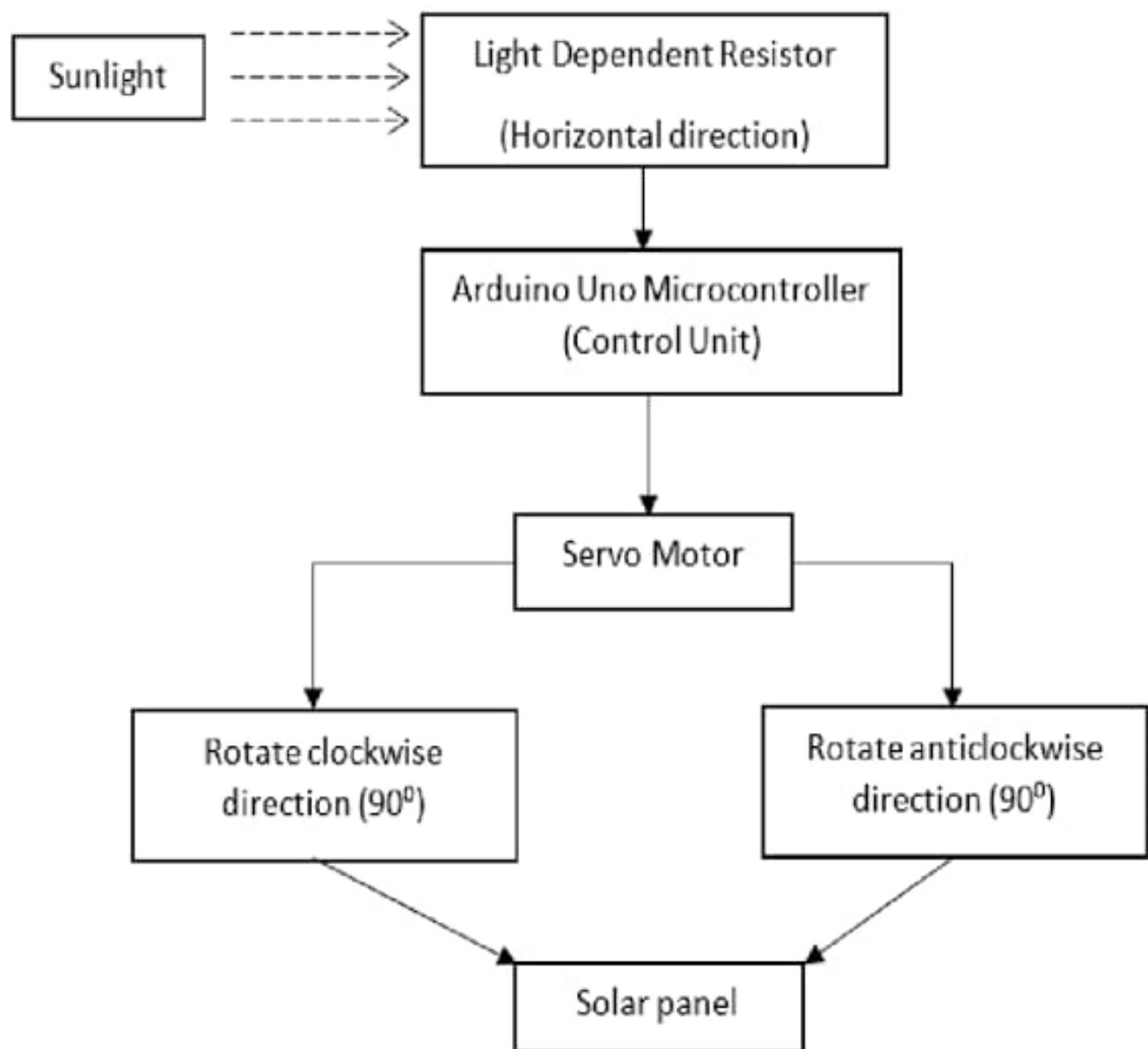


Fig-02: Process Diagram

5. Flow chart:



6. Description of the project:

HOW OUR PROJECT IDEA WORKS:

- The two LDRs are placed on either side of the solar panel (e.g., one on the left and one on the right) to measure light intensity. These sensors are part of a voltage divider circuit that converts the light levels into analog voltage values.
- LDR sensors these are high resistance semiconductors whose resistance decreases with increasing light intensity
- When light falls on these sensors the conductance of these sensors increases which decreases their resistivity
- These sensors are part of a voltage divider circuit that converts the light levels into analog voltage values.
- The Arduino reads the voltage levels from the LDRs. If one LDR receives more light than the other, it means the solar panel needs to move in a specific direction to face the sun.
- The Arduino compares the readings from the LDRs. If the left LDR detects more light, the system will send a signal to the servo motor to move the panel to the right, and vice versa. If both LDRs detect approximately the same light, the panel is already aligned with the sun.

WIRING:

- Connect one leg of both the LDR's to 10k resistors and one to the Analog pin 1 and the other sensor to Analog pin 2 and the other leg of both the LDR's to 0V which is ground
- Now connect the servo motor pins to the Arduino one to VCC (centre) other to Ground (Black/ Brown) and servo pin-07(Yellow)
- Now solder both the ends of the Resistors and connect them to 5V (VCC) of the Arduino

HOW THE PROGRAMMING IN ARDUINO WORKS:

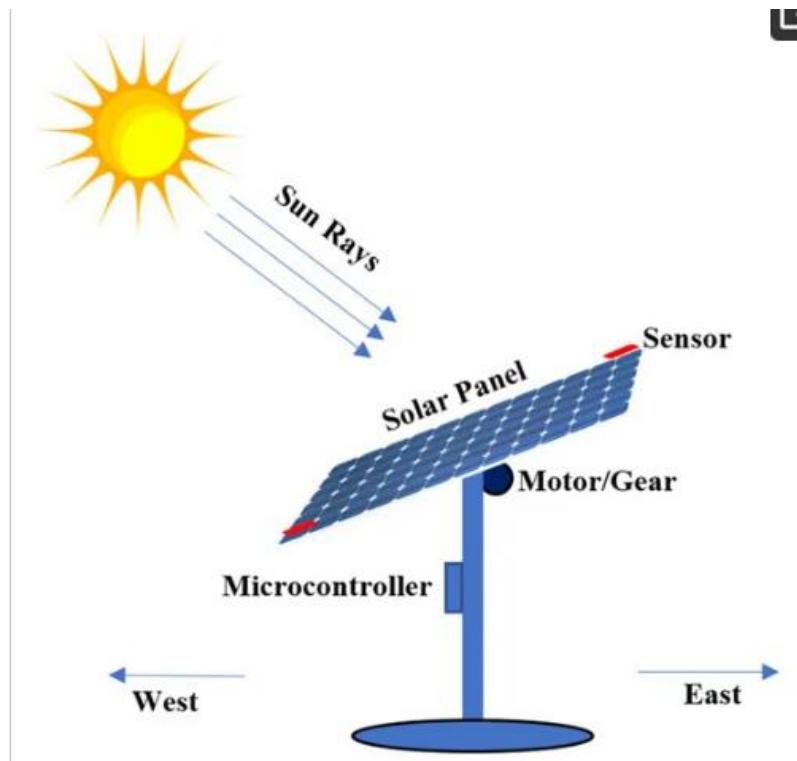
- Firstly, Arduino reads the LDR values from the Analog pins
- Now the Arduino compares the readings to determine which side receives more light
- Now the Servo motor receives the signals from Arduino this moves the solar panel according to the light
- Now, the process is repeated to align the solar panel with the sun

7. Results:

Outcomes Summary:

The solar panel moves according the light from which it can collect the highest energy from the light

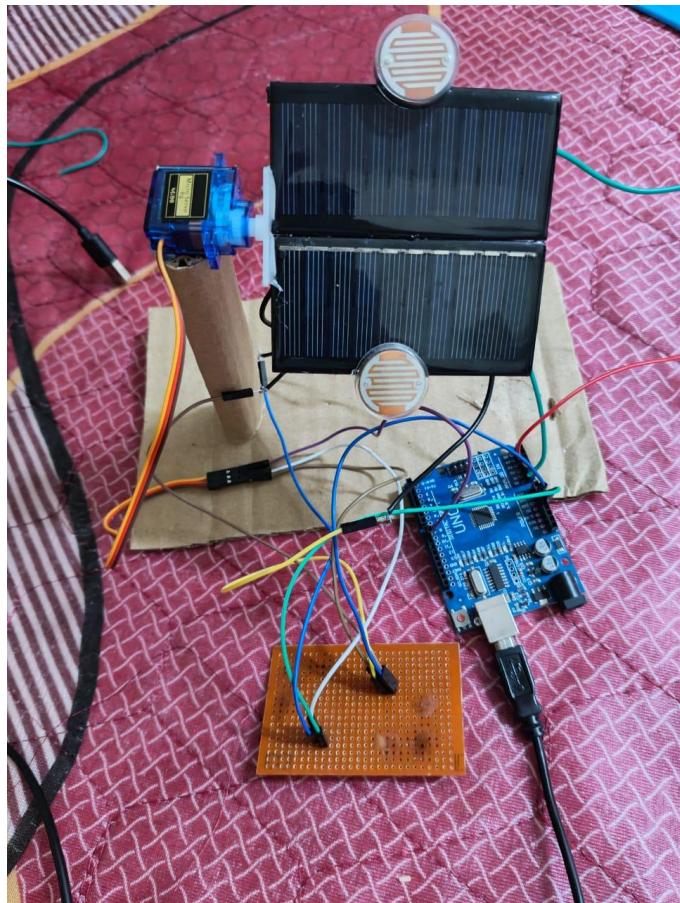
The solar panel rotates as per this illustration:



8. Simulation and short video demonstration:

https://drive.google.com/file/d/11K_3UvFisRtB4fJc6m8Ye8eQJX8a3u8n/view?usp=drivesdk

9. Photo:



10. Bibliography:

References:

Michael Margolis, Arduino cook book, O'Reilly Media, Inc, 4th march 2011.

Thank You 😊

