

# Sunflower

## Description:

The Sunflower: a solar panel that is capable of rotating such that it can get the maximum sunlight. Built with Servo motor in 2 orthogonal planes i.e. capable of rotating in 3d. The Sunflower in a nutshell, wherever the sun goes, it follows like the sun flower and the solar panel will get the maximum sunlight.

## Background:

Normal Solar Panels are unidirectional and stationary. This has a huge drawback. Since intensity of sunlight at different times of the day is not constant, the flux it can produce might also change over the span of the day. For the maximum possible sunrays,  $\overrightarrow{Area} \cdot \overrightarrow{SunRays}$  is maximum when  $\cos\theta$  is maximum; that is when theta is 0 degrees. So, for that, the sunrays should have direct transversion with the solar panel. Since in the case of static position of the solar panel, the intensity of the light slowly decreases as the angle slowly converts from 0 degree to 90 degree. So, at a point the intensity is zero. To minimize this and get the maximum sunlight possible and converting it into Voltaic Cells, our team is making a smart and a dynamic sunlight. It is designed in such a way that the solar panel will tilt in the direction where the sunlight is maximum. And as a result, the angle is minimized to 0 degrees so that the intensity will be maximum, -thus, getting the maximum energy.

## Working:

Our Smart Solar Panel is designed in such a way that it resembles the flower “Sunflower”, tilting in the region of maximum Sunlight. It is powered by 4 LDR sensors and the sensors continuously send signals to the microcontroller. The sensor detecting the maximum light possible will be the reference point and with the help of Servo Motor, the solar panel will be tilting in that direction. All these things have been programmed in the microcontroller – in our case ‘Arduino Uno’. For more detailed working and methodology visit the site

[https://bnksedunp-my.sharepoint.com/:o/g/personal/4133e\\_bnks\\_edu\\_np/EvSIRAR6ZPxAt633N7NSW2oBWdvTOWsxF7Hn5Nd1evOBXw](https://bnksedunp-my.sharepoint.com/:o/g/personal/4133e_bnks_edu_np/EvSIRAR6ZPxAt633N7NSW2oBWdvTOWsxF7Hn5Nd1evOBXw)

## Materials Required:

- > Arduino Uno
- > LDR × 4
- > 10kΩ Resistor × 4
- > Servo Motors × 2
- > Solar Panel
- > Cardboard
- > Jumper Wires

We sincerely request the Knowledge Park and the concerned authorities to help us in all the possible ways. We keenly seek forward to your positive response.

For more details of the project.

## Programming:

```
#include <Servo.h>
```

```

Servo myservo1, myservo2;

int LDR1 = A0, LDR2 = A1, LDR3 = A2, LDR4 = A3;

int rRDL1 = 0, rRDL2 = 0, rRDL3 = 0, rRDL4 = 0;

int max1=0, max2=0, max3=0;

int ser1 = 80, ser2=0;

void setup() {

  myservo1.attach(9);

  myservo2.attach(8);

  Serial.begin(9600);

  myservo1.write(ser1);

  myservo2.write(100);

}

void loop() {

  rRDL1 = analogRead(LDR1) / 100;

  rRDL2 = analogRead(LDR2) / 100;

  rRDL3 = analogRead(LDR3) / 100;

  rRDL4 = analogRead(LDR4) / 100;

  max1 = max(rRDL1, rRDL2);

  max2 = max(rRDL3, rRDL4);

  max3 = max(max1, max2);

  //Serial.println(String(max3));

  //Serial.println(String(rRDL1) +", "+String(rRDL2) +", "+String(rRDL3) +", "+String(rRDL4));

```

```
if(rRDL1<max3 && rRDL2<max3)

{

    if(ser1<140)

        ser1+=1;

    myservo1.write(ser1);

}

if(rRDL3<max3 && rRDL4<max3)

{

    if(ser1>0)

        ser1-=1;

    myservo1.write(ser1);

}


if(rRDL2<max3 && rRDL3<max3)

{

    Serial.println("servo2 +" + String(ser2));

    if(ser2<180)

        ser2+=1;

    myservo2.write(ser2);

}

if(rRDL1<max3 && rRDL4<max3)

{

    Serial.println("servo2 -" + String(ser2));

    if(ser2>0)

        ser2-=1;

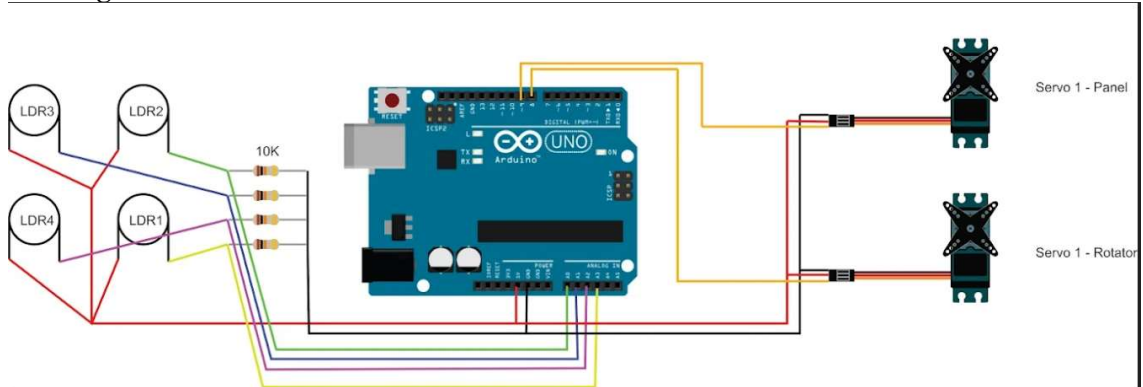
    myservo2.write(ser2);

}

delay(15);
```

}

## Wiring:



If you have any queries, you may contact any one of us.

Thank you very much. Hoping for a positive response.

4133 Adit

4135 Anish

5042 Gaurab

4210 Ichha

4023 Sangya

5043 Riwanj

5096 Susank

4195 Awani

5141 Aayusha

5169 Abhilasha