DEPARTMENT OF
COMPUTER SCIENCE AND ENGINEERING
College of Engineering and Technology, SRMIST

MINI PROJECT REPORT

Odd Semester, 2022-23

Sub. Code & Name : 21CSS201T-Computer Organization and Architecture

Year & Semester : II Year, III sem

Project Title : DUAL AXIS SOLAR TRACKER

Supervisor : **KARTHIKEYAN**

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Reg. No → / Mark split up ↓	RA2211003010145	RA2211003010146	RA2211003010143
Novelty in the project work (1 marks)			
Level of understanding of the design formula(2 marks)			
Contribution to the project (1 Marks)			
Report writing (1 Marks)			
Total (5 Marks)			

Date:

Signature of Lab staff

Abstract:

Dual-axis solar trackers are sophisticated systems designed to optimize the performance of solar panels and collectors by continuously adjusting their orientation to track the sun's position throughout the day. This abstract provides an overview of dual-axis solar trackers, their principles of operation, applications, and benefits.

Introduction:

The dual-axis tracking device tracks the sun to collect more solar energy.
According to the type of axis, the dual-axis tracking device can be divided into two types
***polar-axis tracking**
***altitude–azimuth tracking.**

Polar-axis tracking is also called spinning-elevation tracking.

Objective:

A dual-axis solar tracking system using Arduino is a mechanism designed to automatically orient a solar panel or solar collector to continuously face the sun throughout the day.
By tracking the sun's position, these systems optimize the amount of solar energy captured, thereby increasing the overall efficiency of solar power generation.
The "dual-axis" aspect refers to the system's ability to adjust both the azimuth (horizontal) and elevation (vertical) angles of the solar panel.

Software / Hardware requirements: TINKER CAD

Application:

Dual-axis solar trackers have several applications in the field of solar energy generation and can be particularly useful in situations where maximizing energy production is critical.

Importance:
The primary importance of dual-axis solar trackers is their ability to significantly increase the energy production of solar installations.

By continuously orienting solar panels or collectors to face the sun, these trackers can capture more solar energy throughout the day and across seasons.

This results in higher energy yields and improved system efficiency

Flowchart:
Start
|
v
Initialization: Set up components
|
v
Calibration: Calibrate light sensors
|
v
Main Loop
|
v
Read Light Intensity

|
v
Calculate Target Angles
|
v
Adjust Azimuth Angle
|
v
Adjust Elevation Angle
|
v
Delay (to avoid rapid movements)
|
v
Repeat Main Loop
|
v
End

Codes:

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

void UpDown();
void LeftRight();
Servo servo1;
Servo servo2;
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
void setup() {

  lcd.begin(16,2);
  lcd.print("servo1 ");
  lcd.setCursor(0,1);
  lcd.print("servo2 ");
  servo1.attach(9);
  servo2.attach(10);

  servo1.write(90);
  servo2.write(90);
}

void loop(){

 int sensorTop = analogRead(A0);
 int sensorBottom = analogRead(A1);
 int sensorLeft = analogRead(A3);
 int sensorRight = analogRead(A4);

 int avgT=(sensorTop+sensorBottom)/2;
 int avgB=(sensorLeft+sensorRight)/2;
```

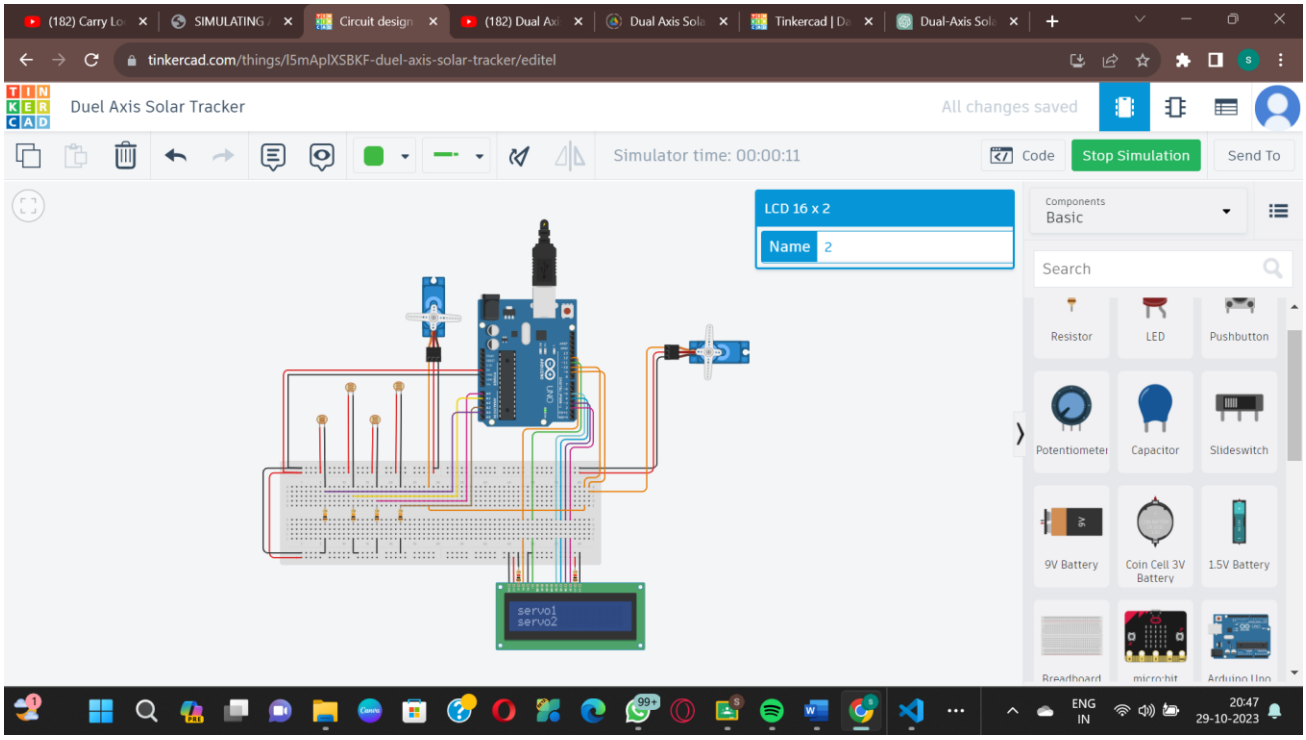
```
 int avgL=(sensorTop+sensorLeft)/2;
 int avgR=(sensorBottom+sensorRight)/2;


  if (avgT > avgB)
  {
     UpDown(sensorTop, sensorBottom);
  }
  if(avgT < avgB)
  {
    UpDown(sensorTop, sensorBottom);
  }
  if(avgL > avgR)
  {
   LeftRight(sensorLeft, sensorRight);
    }
  if(avgL < avgR)
  {
   LeftRight(sensorLeft, sensorRight);
    }
 delay(10);
}
void UpDown(int avgT, int avgB){
  int pos1= servo1.read();

  if(avgT < avgB){
     pos1 = --pos1;
    }
     else
     {
      pos1 = ++pos1;
     }
  servo1.write(pos1);
   lcd.setCursor(12,0);
 lcd.print(pos1);
 }
void LeftRight(int avgL, int avgR){
  int pos2= servo2.read();
  if(avgL < avgR)
   {
    pos2 = --pos2;
   }
    else
    {
     pos2 = pos2 + 1;
    }
  servo2.write(pos2);
  lcd.setCursor(12,1);
 lcd.print(pos2);
```

```
}
```

Output



Conclusion:

Dual-axis solar trackers are important and beneficial components of solar energy systems due to their ability to maximize energy production, increase the efficiency of solar installations, and offer a range of advantages across various applications.

These trackers continuously adjust the orientation of solar panels or collectors to follow the sun's path in both the horizontal (azimuth) and vertical (elevation) directions

Link to demo

https://www.tinkercad.com/things/l5mAplXSBKF-duel-axis-solar-tracker/editel

Reference:

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