

SOLAR TRACKER DESIN AND IMPLEMENTATION

## DEPARTMENT: ELECTRICAL AND ELECTRONICS ENGINEERING

## OPTION: ELECTRICAL AUTOMATION TECHNOLOGY

## LEVEL: 6

## NAMES: UGWANEZA DIDIER

**Solar tracker** is a device that orients a payload toward the sun. Payloads are usually solar panels, parabolic troughs, reflectors, lenses or the mirrors of a heliostat.

At this point the payload we deal with is solar panels. A solar panel is a device that converts sunlight into electricity by using photovoltaic cells. A photovoltaic cell are made of materials that generates electrons when are exposed to light. In order to increase the efficiencies of the solar panels we need the solar tracker to orients our panels according to the sun lays angle.

**PROBLEM STATMENT.**

* There are many problems that occur in the previous type of tracking system. The problem here is the solar panel that used in only fixed position. Because 0f that problem, the efficiency of that panel is low. The price for the solar tracking system is very expensive for the families that use more power than usual because will need to install more than one panel to produce enough of the power they need. To solve those problems this solar tracking system has the ability to rotate at 180 degrees. so the solar panel that will be mounted on it will provide more efficiency compared to when it is on fixed tracking system.
* The other problem here is related with the solar energy. The fixed solar panels are not parallel to the sunlight according to the earth rotation. As the result the power generated here is not the maximum that solar panel was designed for. This solar tracking system is here to solve that problem, by rotating follow the sunlight to support the solar panels to access the sunlight at that level to generate its designed maximum output power, that will also reduce the number of solar panels to be installed, and the cost of solar power system will be low. Also as the solar panel are reduced the time to install them will decrease. Not only that, because there is no need of operator to change the position of the solar panel cause this system will work automatically according to the earth rotation.

**THE COMPONENTS MADE THE SYSTEM.**

1. 4 LDR
2. Microcontroller ( Arduino Uno )
3. Bread Board
4. 2 Servo motor
5. Wires

**THE SOURCE CODES OF SOLAR TRACKER SYSTEM**

#include<Servo.h>

Servo sg90;

int initial\_position=90;

int LDR1=A0;

int LDR2=A1;

int error=5;

int servopin=10;

void setup() {

sg90.attach(servopin);

pinMode(LDR1,INPUT);

pinMode(LDR2,INPUT);

sg90.write(initial\_position);

delay(2000);

}

void loop() {

int R1=analogRead(LDR1);

int R2=analogRead(LDR2);

int diff1=abs(R1-R2);

int diff2=abs(R2-R1);

if(diff1<=error);(diff2<=error);{

if(R1>R2){

initial\_position=-initial\_position;

}

if(R1<R2){

initial\_position=++initial\_position;

}

}

sg90.write(initial\_position);

delay(100);

}

**CIRCUIT DIAGRAM IN PORTEUS SIMULATION**

