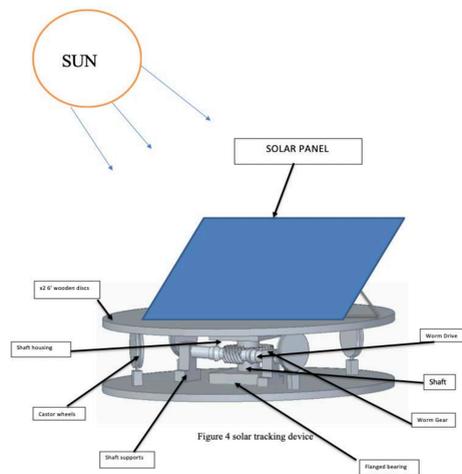


## Introduction

### What is Solar Shadow

- Single- Axis Solar Tracker ('Z' axis)
- Will house a solar panel for the purpose of collecting sunlight.
- The goal of this design is to capture as much energy from the sun as possible.

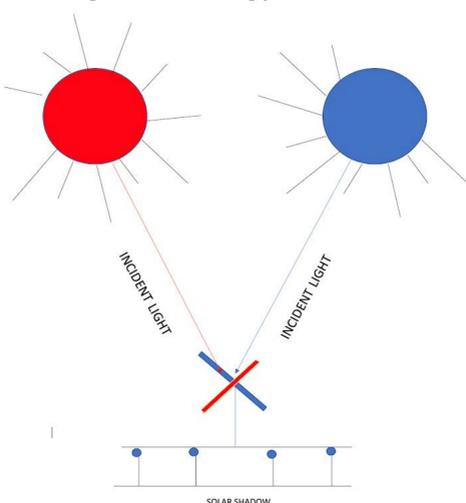


## Purpose

- Optimize the use of solar panels.
- Maximize energy captured from the sun using a solar panel, and to maximize the output wattage provided by the panel
- Compare the results of energy captured using this tracker and a stationary panel.

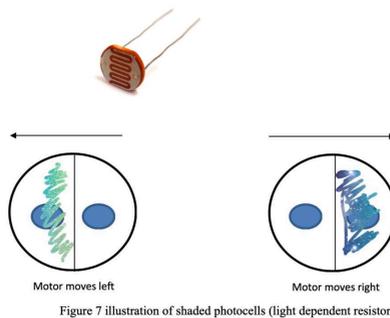
## Why use this solar tracker?

- Solar Panels are mainly used industrially, meaning that there is no personal solar tracking solutions available
- The proposed device can help the performance of solar powered appliances
- The proposed device will collect more incident light from the sun, thus collecting more energy



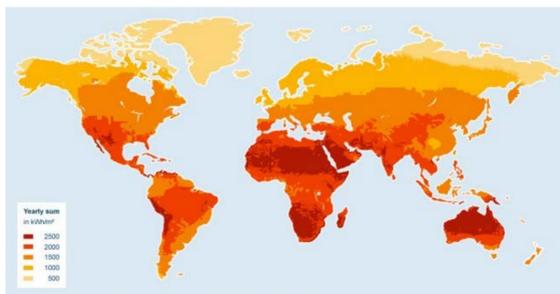
## How it Works

- It is designed to respond to photocell receptors which will then communicate with an Arduino development board.
- When one photocell detects a certain amount of sunlight, the motor will move.



## Who benefits from this device?

- The proposed device will be aimed towards an audience of people who live in hot climates.
- The proposed device will be an ideal addition for people undergoing off-grid living.
- The proposed device will be an option for affordable solar tracking needs or solutions.



A yearly insolation map displaying radiation across the globe.

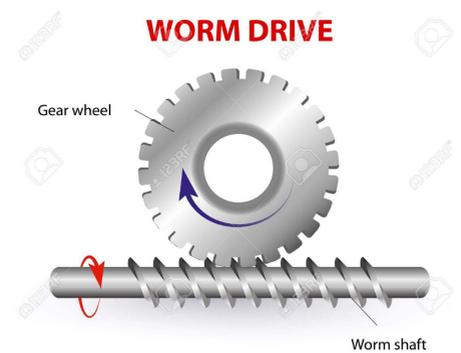
## Background Research

- A solar panel's performance relies on weather conditions
- Angle placement must be considered. Best placement angles are between 30°-35°
- Objects like trees that can shade the solar panels must also be considered for it's performance

## Design Approach

### Worm Gear

- With these gears, you can create a rotation that is high in torque created by the slow-moving stepper motor.
- There will be little to no free movement because of this design



## Programming

- The programme used to develop the coding was Arduino.
- It works with the aid of two light dependent resistors. One is for CCW rotation, and the other is for CW rotation.
- It includes an Adafruit Motorshield, and an Arduino Board.



Adafruit Motorshield



Arduino Development Board



Adafruit and Arduino Stacked

## Device Prototype

