Sun tracking using Arduino

Sunflower is one of the most renowned examples of the heliotropic plants. It is a sun tracking system made and perfected by nature. But can we do the same using an arduino and other electronics stuff? Yes we can and we will.

Applications of such a solar tracking system is a solar tracking solar panel that extracts as much of sun light as it can by moving it into the direction of the sun. This is just one example of the many applications that this kind of system has.

Following is a list of components that you need to make such a thing.

List of materials:

LDR controlled SERVOS		
No	Component	Qty
1	Arduino uno	1
2	Breadboard	1
3	Servo motors	2
4	LDR	5
5	Clothes Peg	1
6	Resistor 10k ohm	5
7	Small container	1

Functionality:

LDR is the light dependent resistor that changes its value based on the amount of light that it receives. There are 5 LDR's connected to the circuit which need to be facing different directions. The amount of light received by each LDR is compared to each other and the LDR that is receiving the highest amount of light sends the message to Arduino to turn the motors in its direction.

Code:

You can find the code in the same dropbox folder where you have found this manual. You can try writing the code yourself if you think you're up for the challenge but to help you with it in either case, following is the explanation for the code that we have for you.

In the start it defines certain threshold values. Currently all of them are initialized to 200 but you can change these values after you've tested it as it is. These values are later compared in the code with the values that the 5 LDRs are generating. Depending upon the value that is being received on the analog pins by the LDRs, the motors are given a value to rotate to a certain

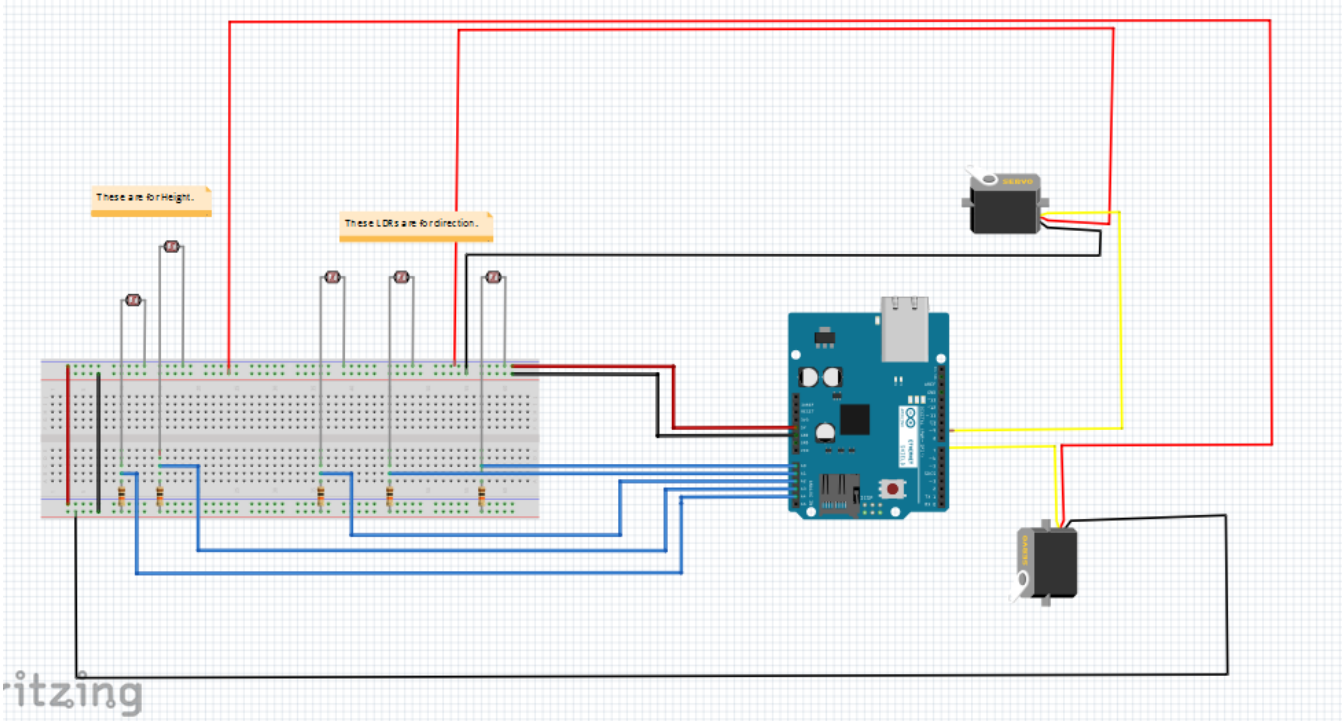
angle. But before the values are fed to the motors, it has a function named map. Arduino stores the value in 10 bits and it converts the voltage value it receives from the Potentiometers in values between 0 to 1023. According to this change in potentiometer value, the rotation of servo motor changes from 0 to 180 degrees.

This function:

map(val, 0, 1023, 0, 180)

Connects the pots and the servo, and maps the values of the input (the pot) to those of the output (the servo)

Circuit diagram

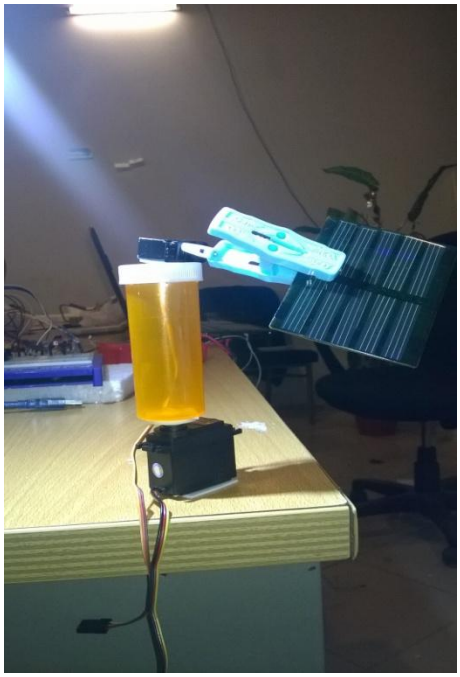


Steps to follow:

- Facilitators will help you with making the circuit. Following are the steps that you should follow:
- Make sure you have Arduino IDE installed
- Connect Arduino to your laptop, verify and upload example code of blink to see if your arduino uno is working. (refer to intro to arduino and electronics.pdf in dropbox folder for help).
- Use the above schematic to make the circuit on breadboard. In the schematic above, red wires are connected to 5V; black wires to the ground; blue ones show connections

between LDRs and analogRead pins; and yellow ones are connecting functional pins of motor to digital pins of arduino.

- If you are able to make the circuit work on arduino, you can try making the one that looks like the one shown below (or maybe that looks even better)



Good Luck!