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FLOATING SOLAR PANEL SYSTEM WITH AUTOMATIC SUN TRACKER

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Abstract: The task is to plan a functioning sun based global positioning framework which ready to follow the daylight with the guide of light ward resistor (I-DR) as information sensor to peruse the force of daylight. The sun powered global positioning framework utilizes stage as a base and it is moved by a DC motor as the stage should be moved towards the daylight to get the ideal light. The sun based global positioning framework is modified by utilizing microcontroller. Arduino UNO as a fundamental regulator. After the arrangement of the equipment and program, the following movement of the global positioning framework has been carried out to follow the sun dependent on daylight course. In this work, it is planned that the movement of the global positioning framework is relies upon the worth perused by LDR. As an end, the sun based global positioning framework can build the sun-based boards proficiency by keeping the sunlight-based boards opposite with sun's position. This system will act on a Floating system in order to reduce the consumption of land.

Index Terms- *Sun Tracking, LDR Sensor, Arduino, Water Floater, Battery, DC Motor, Land conservation, Renewable energy*

I. INTRODUCTION

Throughout the long term the exercises of the sun-based energy have being advantageous humankind. It is obvious that the sun-oriented energy is the most plentiful wellspring of energy on the planet: despite the fact that it isn't the finished solution to the present energy emergency Sun powered energy, brilliant light and warmth from the sun have promptly been outfit by people since directly from the hour of old utilizing a scope of developing advances. The expense of sun-oriented boards has been continually diminishing which energizes its utilization in different areas. Subsequently sun-based force is the fate of inexhaustible force age. The issue with sun powered boards is that they go through a great deal of room on housetops or open regions and are hard to mount, keep up and clean routinely. Moreover, the sun-oriented boards are moved according to sun position can create up to 40% more sun-based force. We thus propose another sort of sun-based boards that can be mounted on water bodies like lake pools so they don't consume any land space Additionally, we present a creative sun tracker and board development framework utilizing Arduino UNO microcontroller and LDR to move the sunlight-based boards according to sun position and produce more force .
Few of the advantages of sun based floating solar panel system are,

- The gliding sun-oriented board power generator presents following key viewpoints
- Does not consume space ashore
- Efficiently coasts on water 24 hours
- Sun position following for the duration of the day Automatically changes sunlight-based board position utilizing Arduino UNO microcontroller
- Reduces dissipation in water bodies by covering them and keeping them cool
- Water is thus used to hold the sun-based boards back from overheating
- Easy to clean sun powered boards utilizing lake pool water.

Fig.1

II. DESIGN:

2.1 LDR SENSOR:

Photoresistors, otherwise called light dependent resistors (LDR), are light delicate gadgets frequently used to show the presence or nonappearance of light, or to quantify the light power. A photoresistor is made of a high-obstruction semiconductor. On the off chance that light falling on the gadget is of sufficiently high recurrence, photons consumed by the semiconductor give bound electrons enough energy to hop into the conduction band. The subsequent free electron (and its opening accomplice) lead power, along these lines bringing down opposition.

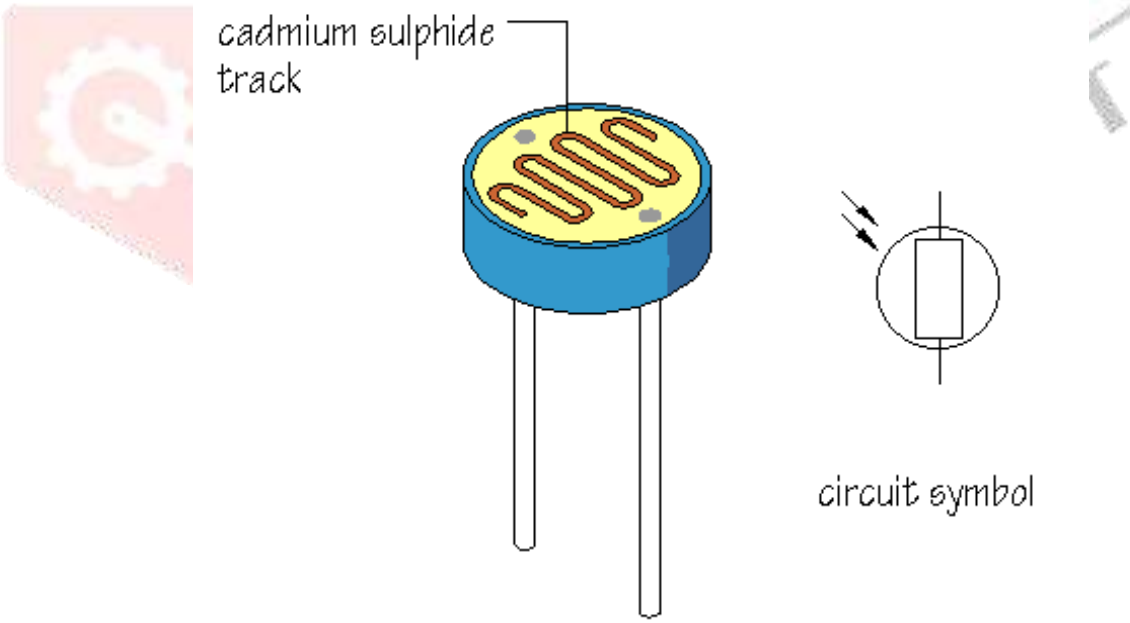

Fig.2

2.2 ARDUINO:

Arduino is an open-source hardware stage dependent on simple to-utilize hardware and programming Arduino sheets can understand inputs - light on a sensor, a finger on a catch, or a twitter message and tum it into a yield - initiating an engine turning on a drove, distributing something on the web. You can guide your board by sending a bunch of guidelines to the microcontroller on the board. Here, the interaction is carried out utilizing Arduino UNO.

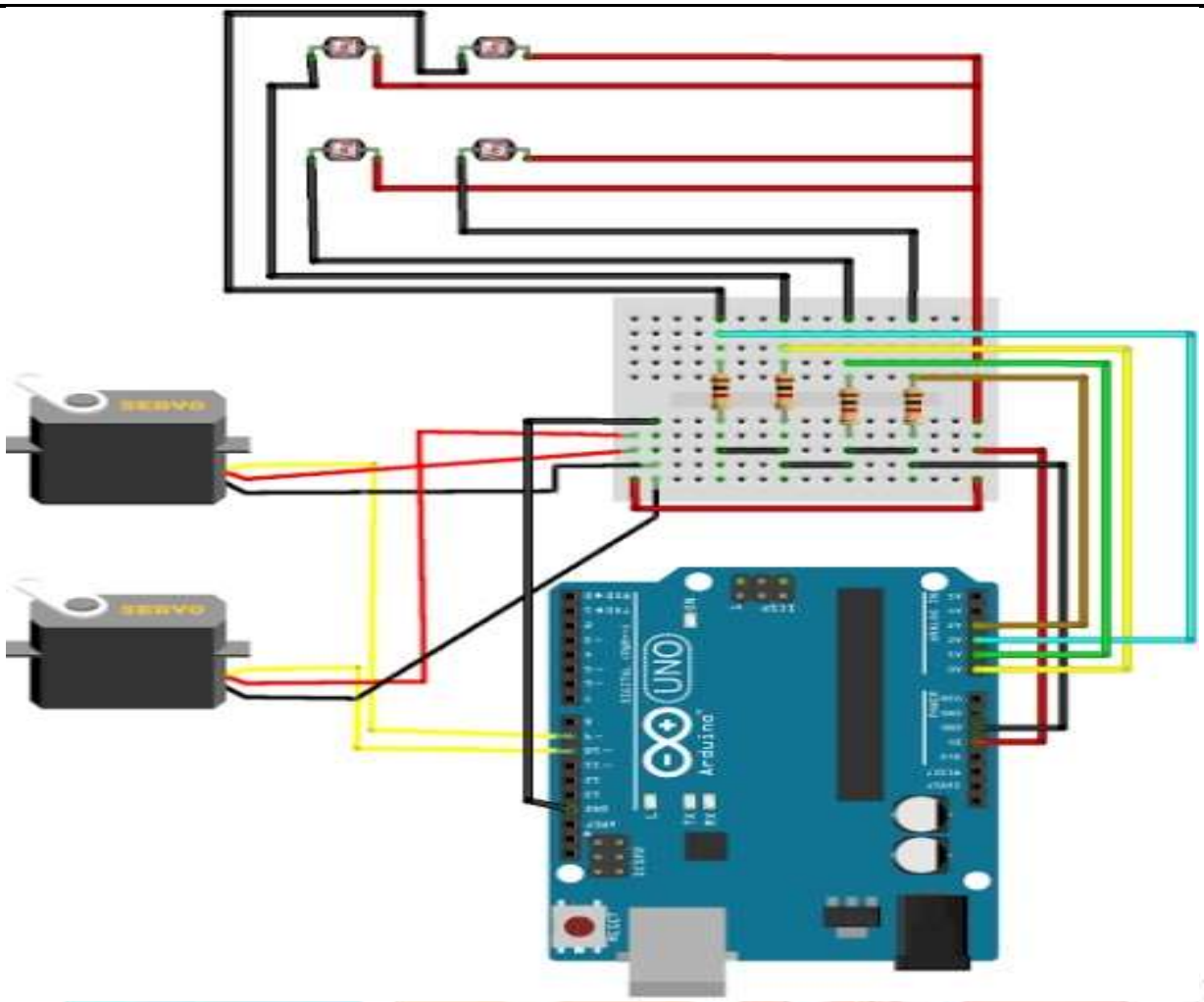

Fig.3

2.3 DC MOTOR:

A DC motor is any of a class of rotational electrical motor that converts direct flow electrical energy into mechanical energy. Practically a wide range of DC motor have some inside system, either electromechanical or electronic, to occasionally alter the course of current in piece of the motor. All D.C machines have five principal components viz

(i)Field system (ii) armature core (iii) armature winding (iv) Commutator (v) brushes

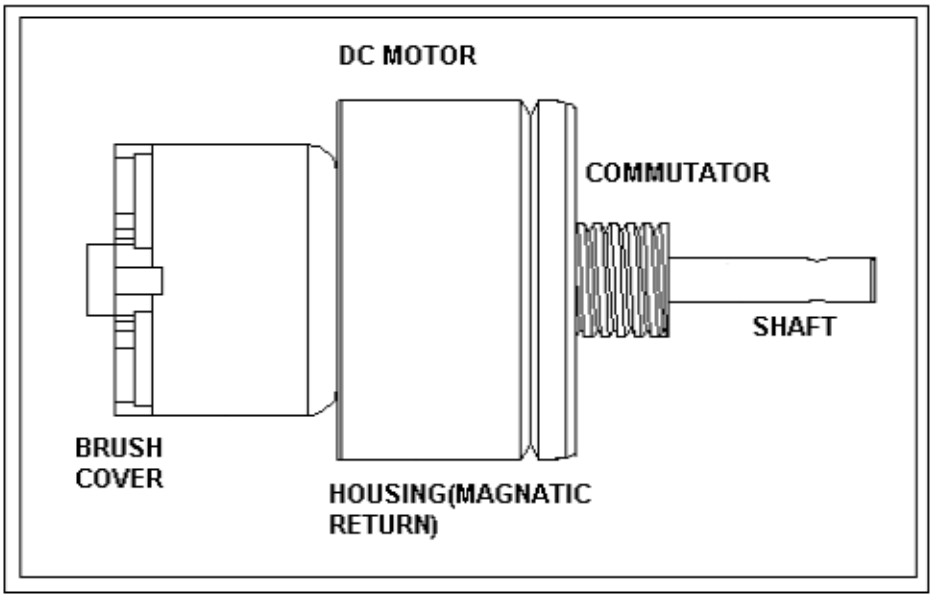

Fig.4

2.4 SUPPORT RODS:

The help poles are by and large used to join the spring to the stationary support part or underlying steel and to move the heap from the pipe onto the spring. Poles are for the most part used on the grounds that they can be readily modified to fit existing site conditions. The Diameter of the support rods is ½ to 6 inches.

2.5 SOLAR PANEL:

An epic greatest force following strategy is proposed for coordinating with the photovoltaic sunlight-based boards to the heap and batteries. The proposed technique depends on the assurance of the subordinate of the board yield power as for the board current while the board current is controlled as a rotting outstanding compass work. In the introduced technique, simple multipliers are not needed to figure the most extreme force point.

The proposed technique is carried out on a 250 W photovoltaic sunlight-based board effectively. In the test arrangement, a rest mode is likewise executed to limit the energy loss of the chopper when the board yield power turns out to be not exactly a preset force esteem.

Fig.5

2.6 WATER FLOATS

Floating photovoltaics (FPV), is a solar array that floats upon a body of water. The solar panels are placed on a buoyant structure to keep them above the water's surface and are usually located on relatively calmer bodies of water such as ponds, lakes and man-made reservoirs.

Fig.6

2.7 BASE FRAME

The solar panels also use metal frame consisting of racking components, brackets, reflector shapes and troughs to better support the panel.

2.8 BATTERY

The basic vehicle batteries in which the terminals are matrices of metallic lead-containing lead oxides that adjustment in arrangement during charging and releasing. The electrolyte is weakened sulfuric corrosive. The new AGM Battery innovation tremendously affects lead-corrosive batteries, making it probably the best battery to use in sunlight based electric frameworks. Modern sort batteries can keep going up to 20 years with moderate consideration, and surprisingly standard profound cycle batteries, for example, the golf vehicle type, should last 3-5 years. Middle batteries, for example, the S460 and different batteries made by Serrette should last 7 to 12 years.

III. METHODOLOGY

- There are two light detecting modules, one for East and the other for the west
- Both the sensors send advanced data about presence and nonattendance of light power to the Micro controller.
- The Micro controller chooses the yield signals for the driver in order to drive the motor in CW or A CW course
- The driver module gets the signs from the micro controller and drives the engine in the predefined bearing with the predetermined speed
- The engine thusly controls the direction of the sunlight-based board mounting structure accordingly, keeping up steady openness to daylight for the duration of the day.
- Since the entire system floats over the water surface, reducing the consumption of land.

IV. CONSTRUCTION AND WORKING:

In this undertaking two LDR is fixed in the sunlight-based board inverse side. LDR is only Light Dependent Resistor which changes the obstruction relies upon the light fall. The shifted obstruction is changed over into voltage signal. At that point the voltage signal is given to enhancer circuit to intensify the voltage signal. The enhanced voltage signal is given to ADC.ADC is only simple to Digital Converter which got the two LDR voltage sign and converts the information simple sign to relating advanced sign. At that point the changed over advanced sign is given to microcontroller. Microcontroller got two advanced signs from the ADC and analyzes that signal. This sign is shifted according to the daylight. The microcontroller shows the relating data on the LCD show and initiates the driver circuit for engine. The engine is connected in the sun-oriented board; this can turn in both forward and invert heading. Through this way sunlight-based board position is altered according to the sun course.

V. CONCLUSION:

As the proposed model is a smaller than expected of principle frameworks, it has a few limits which can be relieved through future turns of events. A little cardboard is turned in the framework and 12 v solar panel is utilized for investigation. As a little framework it turns out great. Bigger solar panels should be incorporated with the framework to plan better outcome and cost investigation. It has been demonstrated through our examination and factual investigation that sun powered global positioning framework with single hub opportunity can build energy yield by around 20 rate. further mechanical upgrade should be possible to the model, to carry out double pivot following An Arduino solar tracker was designed and LDRs were used for better and improved power generation due to increased direct exposure to solar rays. This Increase can be as much as 10-40% depending on the geographic location of the tracking system. It will have a highly efficient installations and are a great fit for both large and small project sites given the proper location and site conditions. Thus this technology will play major role in the Renewable energy industry. The motivation behind environmentally friendly power from this paper presented new and progressed suggestion to help individuals.

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