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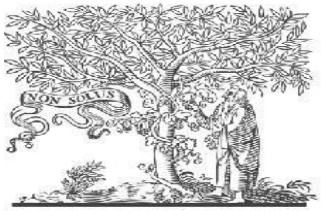

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FLOATING SOLAR PANEL SYSTEM WITH AUTOMATIC SUN TRACKER AND IOT

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Abstract

The aim is to design a working sun-based global positioning framework that is ready to follow the daylight with the help of a light ward resistor (I-DR) as an information sensor to read the force of daylight. The sun powered global positioning framework makes use of a stage as its foundation, which is moved by a DC motor since the stage should be pushed towards the sunlight to obtain the best light. A microcontroller is used to modify a solar-powered global positioning system. The Arduino UNO serves as the primary regulator. Following the setup of the equipment and programme, the following movement of the global positioning framework was performed to follow the sun based on daylight course

It is intended in this work that the movement of the global positioning framework is dependent on the worth evaluated by LDR. Finally, the sun-based global positioning framework may improve the competence of the sun-based boards by retaining the sunlightbased boards opposing the sun's position. This system will operate on a floating system to decrease land use.

Index terms: Sun Tracking, LDR Sensor, Arduino, Water Floater, Battery, DC Motor, Land conservation, Renewable energy.

I. INTRODUCTION:

Sun-based energy workouts have been beneficial to humanity over the long haul. It is apparent that solar energy is the most abundant source of energy on the planet: despite the fact that it isn't the whole solution to the existing problem.

energy crisis People have been harnessing solar energy, dazzling light, and heat from the sun since the dawn of time, employing a variety of evolving breakthroughs. The cost of solar panels has been steadily decreasing, which encourages their use in a variety of applications. As a result, the fate of limitless force age is sun-based force. The difficulty with solar panels is that they take up a lot of space on roofs or in open areas and are difficult to install, maintain, and clean on a regular basis. Furthermore, sun-oriented boards that are adjusted in accordance with the position of the sun can generate up to 40% more solar-based force. As a result, we suggest another type of sun-based board that may be put on water bodies such as lake pools without taking up any land area.

In addition, we provide a novel sun tracker and board development framework that uses an Arduino UNO microcontroller and an LDR to move sunlight-based boards and generate greater force.

Among the benefits of a sun-based floating solar panel system are the following:

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- The gliding sun-oriented board power generator offers the following important perspectives.
- Does not take up any onshore space;
- efficiently coasts on water 24 hours a day; and
- follows the sun position throughout the day.
- Reduces dissipation in water bodies by covering them and keeping them cold.
- Water is therefore employed to preserve the sun-powered boards from overheating.

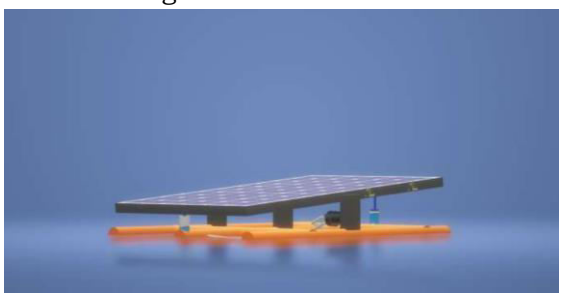

Fig:1

II. DESIGN:

1.LDR SENSOR:

Photoresistors, also known as light dependent resistors (LDR), are light sensitive devices that are widely used to indicate the presence or absence of light or to quantify light power. A photoresistor is a semiconductor with high obstruction. If the light landing on the device is of adequate frequency, photons consumed by the semiconductor provide bound electrons with enough energy to go into the conduction band. The succeeding free electron (and its first accomplice) lead power, knocking down opposition.

LDRs, often referred to as photoresistors, are minuscule light-sensing components. An LDR is a resistor whose resistance alters in response to variations in the quantity of light hitting it. When light intensity is increased, the LDR's resistance goes down. We can utilise them to create circuits for light sensing thanks to this characteristic.

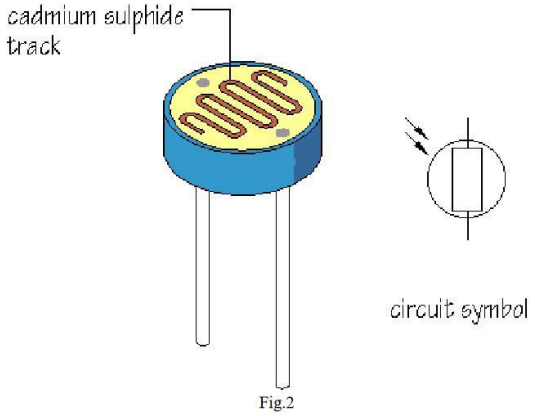

Fig.2

2.ARDUINO:

Arduino is an open-source hardware platform based on basic hardware and programming. Arduino sheets can interpret inputs such as a light on a sensor, a finger on a catch, or a tweet and convert it into a yield such as starting an engine, turning on a drive, or distributing anything on the internet. You may direct your board by sending a series of commands to the board's microcontroller. The interactivity is carried out here with the help of an Arduino UNO.

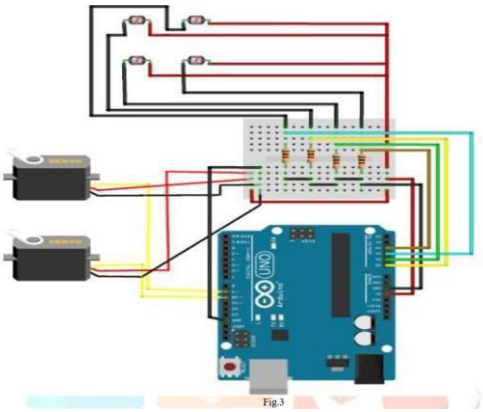

Fig.3

3.DC MOTOR:

A direct current motor is a type of rotating electrical motor that transforms direct current electrical energy into mechanical energy.einsteineruploading up to get together with. All direct current machines have five major components: I a field system, (ii) an armature core, (iii) an

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armature winding, (iv) a commutator, and (v) brushes.

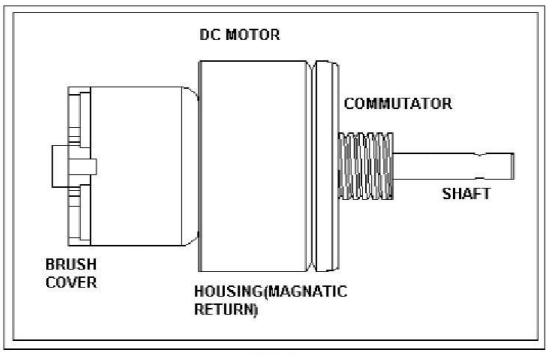

Fig.4

4.SUPPORT RODS:

The assistance poles are often employed to connect the spring to the fixed support portion or underneath steel and to transfer the burden from the pipe to the spring. Poles are commonly utilised because they may be easily changed to match current site constraints. The support rods range in diameter from 12 to 6 inches.

5.SOLAR PANEL:

For coordinating with the photovoltaic sunlight-based boards to the heap and batteries, an epic largest force following method is provided. The proposed approach is based on the guarantee of the board yield power as well as the board current, while the board current is managed as a rotten exceptional compass job. Simple multipliers are not required in the proposed approach to calculate the most severe force point.

The proposed approach works well on a 250 W photovoltaic sunlight-based board. In the test arrangement, a rest mode is also run to reduce the chopper's energy loss when the board yield power is not exactly a predetermined force esteem.

Only a certain amount of electricity can be generated by a single solar module; therefore, most installations use many modules that combine their voltages or currents. An array of photovoltaic modules, an inverter, a battery pack for storing energy, a charge controller, connecting cable, circuit breakers, fuses, disconnect switches, voltage metres, and optionally a solar tracking device are the standard components of a photovoltaic system.

Fig.5

6.WATER FLOATS:

Floating photovoltaics (FPV) is a type of solar array that floats on water. The solar panels are normally installed on somewhat calmer areas of water, such as ponds, lakes, and man-made reservoirs, and are mounted atop a buoyant framework to hold them above the water's surface.

Fig.6

7.BASE FRAME:

Solar panels are additionally supported by a metal frame that includes racking

components, brackets, reflector shapes, and troughs.

8.BATTERY:

The fundamental car batteries, the terminals of which are matrix of metallic lead-containing lead oxides that modify in arrangement while charging and discharging. The electrolyte is corrosive sulfuric. The new AGM Battery innovation has a significant impact on lead-corrosive batteries, making it likely the ideal battery to employ in solar-powered electric frameworks.

Modern type batteries can last up to 20 years with moderate care, while conventional deep cycle batteries, for example, the golf vehicle type, should last 3-5 years. Middle batteries, such as the S460 and other Serrette batteries, should last 7 to 12 years.

III. METHODOLOGY:

There are two light detection modules: one for the east and one for the west.

Both sensors transmit sophisticated data about the presence and absence of light power to the microcontroller.

The microcontroller selects the yield signals for the driver to operate the motor in CW or A CW mode. The driver module receives the signals from the microcontroller and drives the engine in the preset bearing at the predetermined speed.

The engine therefore changes the orientation of the sunlight-based board mounting structure correspondingly, ensuring continuous sunshine access throughout the day.

Because the entire system floats on the water's surface, it consumes less land.

IV. CONSTRUCTION AND WORKING:

Two LDR are fixed in the inverse side of the sunlight-based board in this project. LDR stands for Light Dependent Resistor, and it alters the blockage according on the amount of light falling on it. The voltage signal is converted from the shifted obstacle. The voltage signal is then sent into the enhancer circuit, which amplifies it. ADC receives the increased voltage signal. ADC stands for Analog to Digital Converter, and it takes two LDR voltage signs and transforms the information simple sign to the corresponding advanced sign. At that point, the microcontroller receives the changed over advanced signal. The microcontroller receives two advanced signals from the ADC and evaluates them. This sign changes with the time of day.

The microcontroller displays the relevant data on the LCD display and starts the engine driving circuit. The engine is attached to the sun-oriented board, which may revolve in both directions. The location of the sunlight-based board is therefore adjusted according to the sun's course.

V. CONCLUSION:

While the presented model is a smaller than expected of principle frameworks, it has a few limitations that can be alleviated by future occurrences. A piece of cardboard is inserted into the framework, and a 12 volt solar panel is used for testing. As an example,It works out well. Larger solar panels should be included in the framework to design a better outcome and cost analysis. Our research and factual study have proven that a solar-powered global positioning framework with a single hub possibility can increase energy production by roughly 20%.Additional mechanical upgrades to the model, such as double pivot following, should be conceivable. Due of increased direct exposure to sun rays, an Arduino solar tracker was created and LDRs were employed for better and enhanced power output. This increase might range from 10% to 40%, depending on the monitoring system's geographic location. With the

correct location and site circumstances, it will have a highly efficient installation and will be a wonderful fit for both big and small project sites. As a result, this technology will play a significant role in the renewable energy market. This paper's motive for environmentally friendly electricity gave new and advanced suggestions to assist folks.

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