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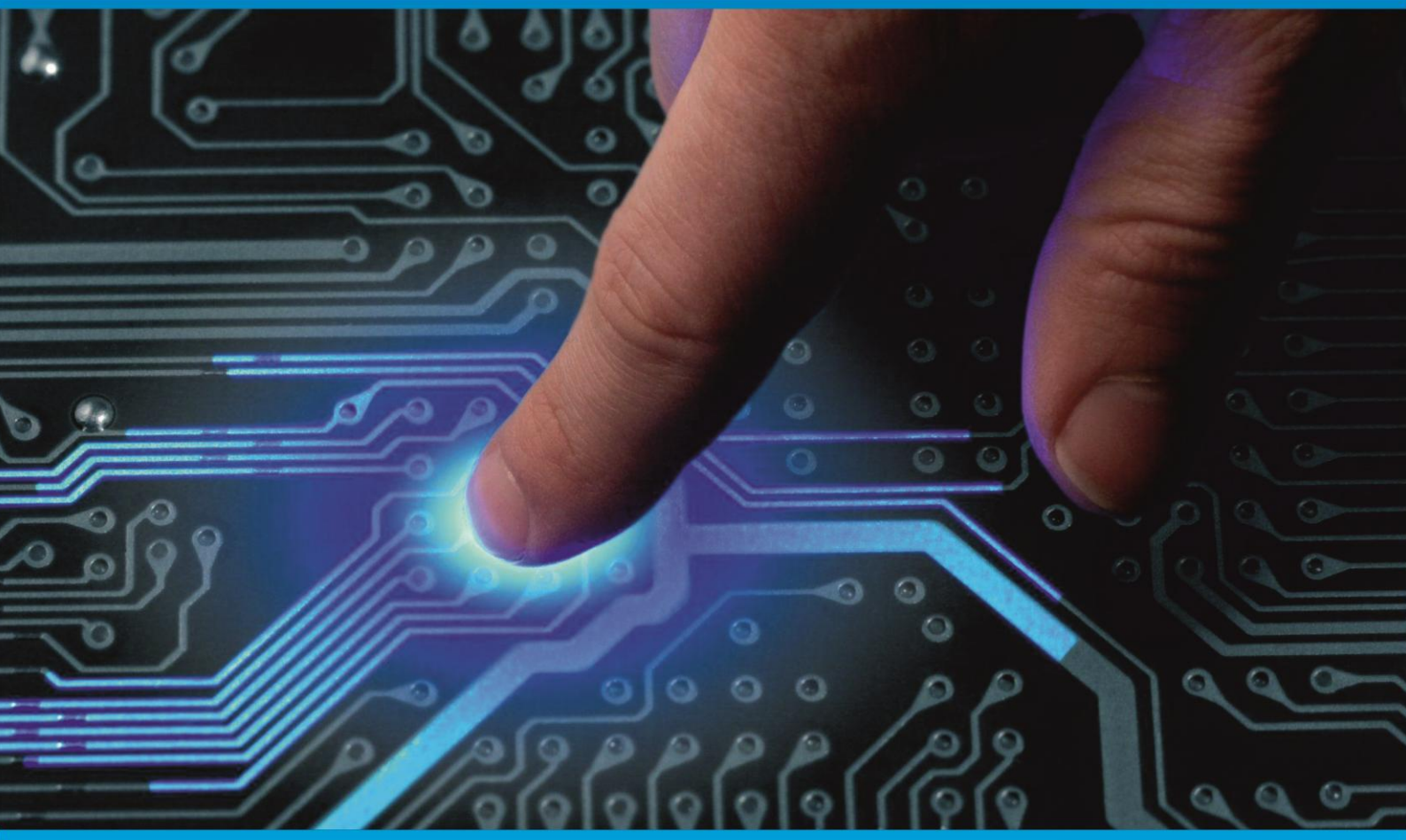

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Arduino Based Mobile Sun Tracking Solar Panel

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ABSTRACT: The Sun Tracking System for Solar Panel Project is designed to track the Sun during the day in order to appropriately utilise its solar energy for solar panels. Sun trackers are all-weather, dependable, and cost-effective tracking and location devices. The Solar Panel is oriented toward the sun in this project so that it may be used more accurately. Our Sun Tracker system uses sensors to track the Sun and a stepper motor to rotate the solar panel. Trackers are used in flat-panel applications to reduce the angle of incidence between the incoming light and the solar panel. This boosts the quantity of energy generated from a fixed amount of installed power generation capacity. In concentrated solar applications, the optics accepts the direct component of sunlight light and converts it to heat.As a result, it must be angled correctly to collect energy. Because concentrators do not create energy until they are pointed closely toward the sun, tracking devices are used in all of them.

The greatest problem for the next half-century will be generating power from the reduction of fossil fuels. When compared to other renewable energy sources, the idea of turning solar energy into electrical energy using photovoltaic panels is at the top of the list. However, as the sun's relative angle to the earth changes, the number of watts delivered by solar panels decreases. In this case, a solar tracking system is the ideal option for increasing photovoltaic panel efficiency. Throughout the day, solar trackers pull the payload closer to the sun.

KEYWORDS: SolarEnergy,Photovoltaic (PV) Concentrated Solar Power (CSP), Microcontroller, Solar Energy, Arduino, Tracking.

I. RELEVANCE

Solar trackers have become popular additions to solar photovoltaic (PV) systems. Their capacity to detect the sun's shifting position in the sky can significantly increase the energy gains of PV systems, up to 25% to 30% in some circumstances, depending on energy demand.

Fig.1. Solar tracking system.

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II. LITERATURE SURVEY

Due to a scarcity of resources, modern society has been obliged to find ways to meet the demands of the latter. The depletion of conventional fuels as a result of human actions has been a source of concern for sustainable development challenges. Because of the paucity of energy and its source, we took the hopeful approach of utilising the alternative resources that have been given upon humanity–solar, tidal, and so on. The Sun has long been regarded as a vital source of energy. Solar energy is a more environmentally friendly resource than its equivalents. The evolution of technology has resulted in the development of strategies for putting this energy to good use. It could be thermal energy, electricity, fuel generation, or a variety of other things. Photovoltaic (PV) and concentrated solar power (CSP) systems are used to generate electricity.Due to a scarcity of resources, modern society has been obliged to find ways to meet the demands of the latter. The depletion of conventional fuels as a result of human actions has been a source of concern for sustainable development challenges. Because of the paucity of energy and its source, we took the hopeful approach of utilising the alternative resources that have been given upon humanity–solar, tidal, and so on. The Sun has long been regarded as a vital source of energy. Solar energy is a more environmentally friendly resource than its equivalents. The evolution of technology has resulted in the development of strategies for putting this energy to good use. It could be thermal energy, electricity, fuel generation, or a variety of other things. Photovoltaic (PV) and concentrated solar power (CSP) systems are used to generate electricity.

The Sun, as a reservoir of energies, has been observed to be the preeminent and ever-continuing source of generating radiation. The solar panel receives a portion of this natural energy source. Certain methods for utilising this energy source as an alternative to other non-renewable sources have been devised. The manipulation of the energy source is encouraged due to its numerous blossoming methods in which it may be employed to bring about a change in the conservation of other resources. Solar panels are thus utilised to convert solar energy into electrical energy. They are positioned in various regions in order to collect as much solar energy as possible. Solar panels can be used to absorb or collect solar energy, but their use is limited to particular hours of the day and the availability of sunshine.pouring straight on them, i.e., the sunrays and the panel are at an orthogonal angle. The angle of the sunrays is different at other times of the day, therefore the amount of solar power captured is much lower. Solar tracking devices were developed to avoid such traps and to capture the maximum amount of solar energy available. The goal of a solar tracking system is to keep the angle between the sunrays and the solar array at 90 degrees.

III. PROPOSED WORK

3.1 Problem statement

The earlier sort of solar tracking device has a number of drawbacks. The issue here is that solar panels are only used in fixed installations. As a result of this issue, the amount of electricity that can be created is limited. Another issue is that the cost of a solar tracking system is prohibitively expensive for families who use more energy than usual because it requires the installation of many solar panels to generate sufficient power. As a result, the goal of this project is to resolve the issue.

3.2 Details

An implementation of a Sun tracking solar panel with an Arduino Uno is proposed in this dissertation work. LDRs, a solar panel, a motor, and an Arduino Uno make up the sun tracking solar panel. On the solar panel's margins, light-dependent resistors are positioned.

When light falls on a light dependent resistor, it produces a low resistance. The panel is rotated in the direction of suction by the servo motor connected to it. The panel is set up in such a way that the light from two LDRs is compared, and the panel is rotated towards the high-intensity LDRs.When the intensity of light falling on the right LDR is greater, the panel slowly moves to the right, and when the intensity of light falling on the left LDR is more, the panel

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slowly travels to the left. The sun is ahead at noon, and the intensity of light on both panels is the same. In such circumstances, the panel remains stationary and does not rotate. The battery stores the energy generated by the panel.

IV. FLOWCHART

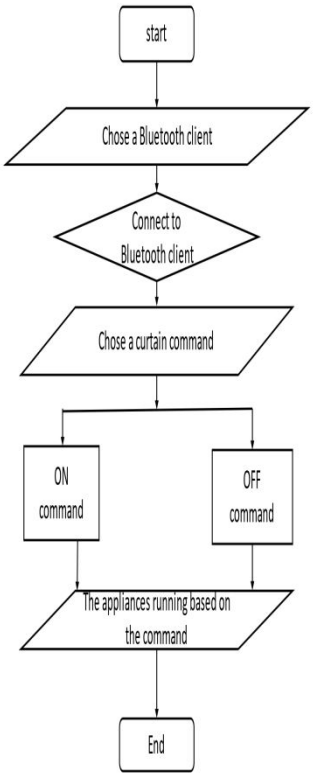

Fig.2. Flowchart of system.

Algorithm:

1. Initialize/ Start all the modules.
2. Start to collect the data by sensor.
3. Monitor the data from the sensor.
4. Sends the data reading to motor.
5. According to that data panels moves.
6. Energy is generated and stored in battery.
7. AC appliances are controlled by android application.
8. Stop.

V. CONCLUSION

We could get all the energy we'll ever need from solar energy. We have the capacity to harness this energy, but we must spend more money, advance our technology, and perfect it. Because of this, we think solar energy is the energy of

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the future and can meet all of our needs for energy, including eradicating the pollution brought on by other methods of producing electricity.

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