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Solar Tracking On Satellite ByUsing Of IOT

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ABSTRACT:

Satellites can be classified by their functions. Satellites are launched into space to do a specific job. The type of satellite that is launched to monitor cloud patterns for a weather station will be different than a satellite launched to send television signals across Canada. The satellite must be designed specifically to fulfill its function. But, it need of electricity, which gave the power for his work done in space. In space only one source of energy is been find which is solar energy. Solar panel is placed on satellite but it is fixed it is non - movable. When solar ray has been fall on panel only one direction. It can't change its direction.

The power generation using solar energy has been used widely many years ago due to fuel shortage and its low cost. In this paper, a design and implement of dual axis solar tracking system has been implemented using programmable logic controller (IOT). This proposed system, keeps the solar panels aligned with the sun during the sunrise hours, in order to maximize solar power extracted from the sun In this work an open loop control systems been designed and carried out using IOT, and direct current motors for solar cell sun tracking. The tracking has done in two manner, that is, the daily sun tracking vertically. And the seasonal sun tracking horizontally.The second tracking technique.

Computes the difference in the day hours per year in four seasons, with the aid of IOT program, which is the solar time of the day hours or the sunrise hours of the day. After the system has completely installed a suitable measurement has been carried out for the fixed and moving solar panel. As compared with usual fixed panels, the power that has been obtained from the solar system is 38% better than the fixed technique. On satellite solar panel has been placed in perpendicular direction. On supporting of solar panels we get placed a motor for rotating it plates towards sun rays direction in fully 360 degree .which consumption of solar energy in rotating plate get better than in fixed plate.

***Keywords**: Energy consumption, IOT, heuristic optimization, solar tracking system, tracking error.*

INTRODUCTION:

One of the most encouraging sustainable power sources described by a colossal capability of change into electrical force is sunlight based vitality. The transformation of sun oriented radiation into electrical vitality by Photovoltaic (PV) impact is a promising innovation, being perfect, quiet and dependable, with exceptionally little support expenses and little environmental effect. In the space Satellite is rotating Around the For is Specific Job Such as communication, Monitoring Tacking etc. In the space Satellite is turning Around the For is Specific Job Such as correspondence, Monitoring Tacking and so on. In the Space sun powered vitality Is the main Source which Gave the Power to the Satellite For His .But, Solar board is put on satellite yet it is fixed it is non - mobile. At the point when sunlight based beam has been fall on board just a single bearing. Sun powered Can't Consume Lot of Energy From Sun That,s Why additionally Get Efficiency Decrease. My Project Will Get Help to expand the force productivity of satellite .By utilizing IOT(Internet Of Thing) technique On sun powered board LDR Sensor are put for recognizing the vitality that is associated toward'sIOT .Whenever Rating of light power Decreases Sensor Gives Data to the IOT System ,On which Direction Light force is More IOT framework Operate the Servo Motor And Rotate the sun based board upto 360 Degree Where the Light force is More. Satellite have double hub sun based board Therefore, This is put on both side . For increment the force effectiveness of satellite.

Problem Statement:

A sunlight based tracker gadget has a wide scope of uses to improve outfitting of sunlight based insolation. The issue presented in this way is to execute a framework that is able of improving sunlight based force generation by 30-40%. An IOT(Internet Of Things) is utilized to execute the control circuit which thus positions an engine used to situate the sun oriented Solar Panel ideally.

RELATED WORK

1) Internet of Things(IOT)

The Internet of Things (IOT) imagines a not so distant future and is an ongoing correspondence worldview, in which the objects of regular day to day existence are furnished with microcontrollers, handsets for correspondence, and reasonable convention stacks that will make them ready to speak with each other and with the clients, turning into a necessary piece of the Internet. This framework targets making the Internet much increasingly vivid and unavoidable. Additionally by empowering simple access and cooperation the web of things will cultivate the advancement of various applications that utilize the possibly colossal sum and assortment of information produced by such articles to offer new types of assistance to residents, organizations, and open organizations by utilizing assortment of gadgets, for example, for example, home apparatuses, reconnaissance cameras, checking sensors, actuators, showcases, vehicles, etc.

Proposed Methodology:

1) Transmitter side :

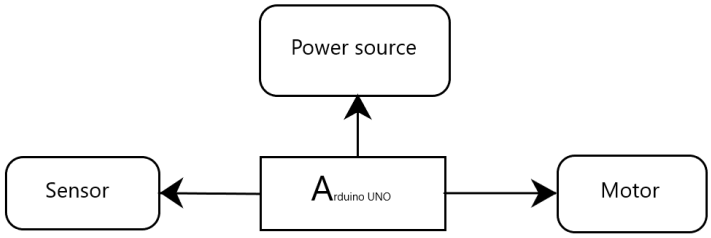
In this the data is collected from the LDR Sensor from Solar Panel. This data is been give to the modules which do the work of monitoring of the readings of the sensors compare it with the rated value under the permissible limits. And transmits data through wire to the receiver side .

2) Receiver Side :

In this the data is been collected from the transmitter and then again compared with the rated value under permissible limits. And thenits given to the IOT interfacing module.

3) Intermediate Stage:

The intermediate stage includes Connection with servo motor as, the IOT give the action to servo it get rotate to the particular angle.



Component Required:

1. Arduino UNO
2. Servo Motor
3. Light Sensors
4. Solar Panel
5. LDR

1) Arduino AT328

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

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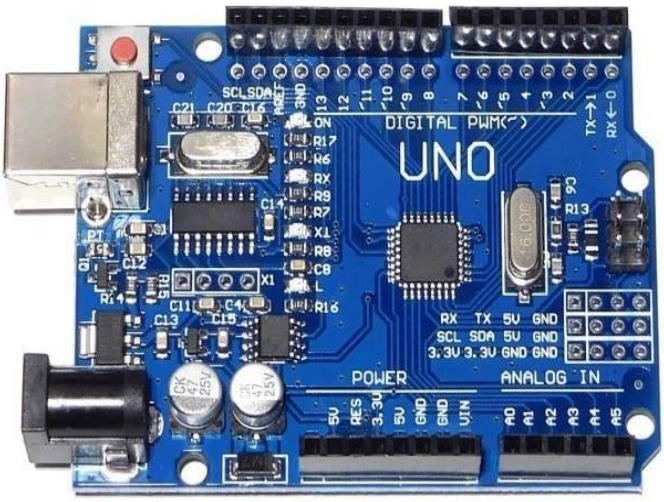

2) Servo Motor:

A servo motor is an electrical device which can push or rotate an object with great precision. If you want to rotate and object at some specific angles or distance, then you use servo motor. It is just made up of simple motor which run

through servo mechanism

3) Light Sensors

A Light Sensor is something that a robot can use to detect the current ambient light level - i.e. how bright/dark it is. There are a range of different types of light sensors, including 'Photoresistors', 'Photodiodes', and 'Phototransistors'. ... If it detects a bright light, it lets a larger amount of current through.

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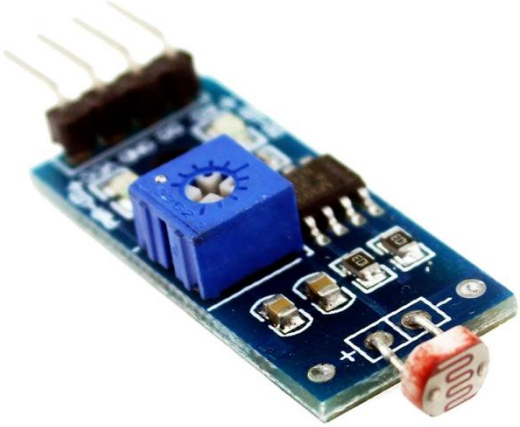
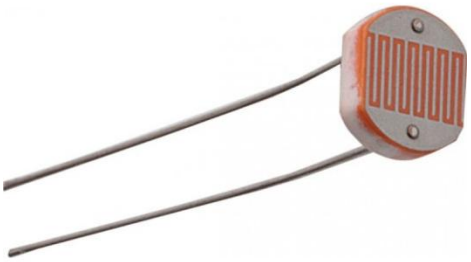


4) Solar Panel

A solar panel converts sunlight into an electric current or heat used to provide electricity for home or building. Solar panels are constructed as a collection of lots of small solar cells that are spread over a large area to provide enough power. The larger the concentration of light hits the cell the more electricity or heat is produced.

4) LDR

An LDR is a component that has a (variable) resistance that changes with the light intensity that falls upon it. This allows them to be used in light sensing circuits. A typical LDR.



WORKING:

1) LDRs are used as the main light sensors. Two servo motors are fixed to the structure that holds the solar panel. The program for Arduino is uploaded to the microcontroller. The working of the project is as follows.
2) LDRs sense the amount of sunlight falling on them. Four LDRs are divided into top, bottom, left and right.
3) For east – west tracking, the analog values from two top LDRs and two bottom LDRs are compared and if the top set of LDRs receive more light, the vertical servo will move in that direction.
4) If the bottom LDRs receive more light, the servo moves in that direction.
5) For angular deflection of the solar panel, the analog values from two left LDRs and two right LDRs are compared. If the left set of LDRs receive more light than the right set, the horizontal servo will move in that direction.
6) If the right set of LDRs receive more light, the servo moves in that direction.

LITERATURE SURVEY:

The Internet was a network of networks, linking various government and academic computers together to share information. What has changed increasingly over the past two decades is the ability to connect remote and mobile "things" or "machines" or "assets" to the Internet or corporate Intranets through the role of wireless communications and low-cost sensors/computing/storage. In a sense, the Internet is amplifying from a net of computers to a network of things. Object in the Earth is transitioning to become a data processor that happens to be linked to a network using the IP protocol. The confluence of efficient wireless protocols, improved sensors, cheaper processors, and a number of startups and established companies producing the necessary management and application software has finally arrived at the concept of the Internet of Things mainstream. The driver of all this connectivity is basically the desire to "add value" to products or services. These additional profits from connecting everything to the Internet are roughly evenly distributed between increased asset utilization, increased employee productivity, better logistics management, better client experiences, and increased R&D productivity. The applications that appear to be prime for IoT disruption include home automation, appliances of all cases, wearable computing devices, home health care, retail and warehousing inventory management, connected farms/agriculture equipment, solar energy generation and likely many more are still being formulated. In sum, the IoT will create tens of billions of dollars of new revenues per year for telecom service providers, semiconductor vendors, software application vendors, and merchandise vendors, and potentially create substantial market share shakeups, especially in end markets not used to the pace of engineering-based competitor. IoT is one of the quickest-developing technology trends, where all types of devices and machines are connected and "talk" to one another.

To come up to this issue, control panel companies can embrace the Internet of Things, also known as the Internet of Everything. Generally defined as the universe of more Internet-connected endpoints designed with machine-to-machine interactivity, IoT has the potential to dramatically transform energy companies, according

to Cisco. For instance, a control panel company can put in sensors on panels to monitor their execution and provide real-time insight to site management teams. Solar automation can be described as introduction of engineering inside the panel environment to provide convenience, comfort, security and energy efficiency to its occupants. With the entry of the Internet of Things, the research and implementation of automation are getting more popular.

- **Software Requirements:**
  1) Operating System: Windows 10 Home Single Language
  2) Arduino IDE.

ADVANTAGES:

1. Trackers generate more electricity than their stationary counterparts due to increased direct exposure to solar rays. This increase can be as much as 10 to 25% depending on the geographic location of the system. Remote monitoring is possible.
2. Solar trackers generate more electricity in roughly the same amount of space needed for fixed-tilt systems, making them ideal for optimizing Losses.
3. Trackers generate more electricity than their stationary counterparts due to increased direct exposure to solar rays. This increase can be as much as 10 to 25% depending on the geographic location of the tracking system.
4. There are many different kinds of solar trackers, such as single-axis and dual-axis trackers, all of which can be the perfect fit for a unique jobsite. Installation size, local weather, degree of latitude and electrical requirements are all important considerations that can influence the type of solar tracker best suited for a specific solar installation.
5. Solar trackers generate more electricity in roughly the same amount of space needed for fixed-tilt systems, making them ideal for optimizing land usage.
6. In certain states, some utilities offer Time of Use (TOU) rate plans for solar power, which means the utility will purchase the power generated during the peak time of the day at a higher rate. In this case, it is beneficial to generate a greater amount of electricity during these peak times of the day. Using a tracking system helps maximize the energy gains during these peak timeperiods.
7. Advancements in technology and reliability in electronics and mechanics have drastically reduced long-term maintenance concerns for trackingsystems.

DISADVANTAGES:

1. Solar trackers are slightly more expensive than their stationary counterparts, due to the more complex technology and moving parts necessary for theiroperation.
2. Trackers are a more complex system than fixed racking. This means that typically more complex preparation is needed, including additional trenching for wiring and some additional grading.

APPLICATIONS:

1. Communication Satellite
2. Rover's
3. Other Space Equipment.

CONCLUSION:

- The invention of Solar Tracking System helps us improve the performance of PV solar system in a simple way.
- Used Relative method of Sunlight Strength.
- Established a model of automatic Tracking System to keep vertical contact between solar panels and sunlight.
- Improved the utilization rate of solar energy and efficiency of photovoltaic power generation System.

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