Retraction

Retraction: Solar Based Charging Station for E-Vehicle (J. Phys.: Conf. Ser. 1916 012130)

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This article (and all articles in the proceedings volume relating to the same conference) has been retracted by IOP Publishing following an extensive investigation in line with the COPE guidelines. This investigation has uncovered evidence of systematic manipulation of the publication process and considerable citation manipulation.

IOP Publishing respectfully requests that readers consider all work within this volume potentially unreliable, as the volume has not been through a credible peer review process.

IOP Publishing regrets that our usual quality checks did not identify these issues before publication, and have since put additional measures in place to try to prevent these issues from reoccurring. IOP Publishing wishes to credit anonymous whistleblowers and the Problematic Paper Screener [1] for bringing some of the above issues to our attention, prompting us to investigate further.

[1] Cabanac G, Labbé C and Magazinov A 2021 arXiv:2107.06751v1

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Solar Based Charging Station for E-Vehicle

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Abstract. An E-vehicle charging station, otherwise known as an EV charging station, an electric re-energize point, a charging point, an electronic charging station (ECS), or an electric vehicle supply hardware (EVSE), is a piece of a framework that gives electric energy to the re-energizing of module electric vehicles, like electric vehicles, local area electric vehicles, and module mixtures. The main objective of this paper “Solar Based Charging Station for E-Vehicle” is to generate maximum power from the solar panel by tilting its angle based on the intensity of the light that falls on it. Also, the amount of power available in the charge station is continually monitored locally and from the remote area by using the concepts of Internet of things.

Keywords: Renewable energy, Geared DC motor, Solar panel, GSM Module, Arduino UNO.

1. INTRODUCTION
The infrastructure that provides the power to refill electric vehicles is known as the E-vehicle re-energizing station or EV charging station, power charger, charging station, electric charging station (ECS), and electric vehicle supplier (EVSE), like hybrid buses, electric cars in the neighbourhood, and interest plug-ins. The main purpose of this paper “Solar Based Charging Station for E-Vehicle” is to get the most energy out of the solar panel by changing the angle of rotation in response to the strength of light falling on it. With this process we can get a lot of energy from the solar panel from different sides of the slope[1]. Depending on the availability of sunlight, the solar panel tiltangle is determined. In addition, the Thinkspeak webserver continuously tracks the amount of energy generated by the solar panel and the amount of load used by the electric car charging station. The highest energy from the solar panel is obtained using different moving angles, the amount of energy produced by the solar panel is greater than when the solar panel is placed in a fixed position.

An electric car charging station is a place where a line is drawn on every electric car for a charge. These charging channels are sent to the standard separation range to make the public domain easily accessible. Just like ordinary cars like gasoline engines get fuel at a gas station, the charging stations are a place to charge electric cars. As it plays a necessary role in charging electric batteries, it is necessary to monitor its performance within and within the Internet of Things[2]. With the existing system of scarcity lacking
scalability, it becomes difficult to build an E-car charging station from a remote end. And in the present system the energy produced by the solar panel is made only by one angle of inclination [3]. This startup system will only generate limited power and power that can be started at various tilt angles not used. Even more so even at a solar charging station the amount of energy produced on that sunny day and in the afternoon will be higher compared to the energy produced in the morning or evening [4]. This is mainly due to the lack of sunlight falling on the solar panel. Here there is a problem or if there is sunlight, it falls into the wrong axis and therefore the electrical energy from the solar panel is small. The proposed system uses the ARDUINO UNO microcontroller as its operating principle. It features a powerful Atmega328 8-bit microcontroller unit for its processing purposes [5]. In the proposed work, the power of the photovoltaic panel is emitted on different sides of the slope which is why the energy released in this way remains higher than the traditional power generation with the solar panel on the fixed side. Increasingly the Internet of Things data makes distribution and that is why data can be accessed from any location. In addition, as our system uses solar energy as the main source of energy, the amount of electricity used from the grid is greatly reduced and saves energy [6].

2. BLOCK DIAGRAM

The above figure 1 represents the systematic block diagram of this project “Solar Based Charging Station for E-Vehicle". As shown in the block diagram, AC mains are described in order to fetch the power from the AC main source and the voltage AC signal is then stepped down by the step down transformer to receive the low from the high. Thus obtained AC signal is processed [7-10] through bridge rectifier in order to extract the DC voltage which is required to operate the microcontroller. Thus the obtained DC source is an unregulated and rippled DC power source, the capacitive filter and voltage regulator like 7805 are used to obtain regulated DC power source for the microcontroller operation. In the above described block the LDR sensors is deployed in both direction North and South side in order to track the sunlight exact position. The amount of sun light intensity that falls in the North LDR is greater than that of the South LDR means the solar panel tilt motor will get rotated towards North Direction[11]. And in other case the operation is wise versa. Other supporting components like 16X2 LCD display are interfaced with ARDUINO microcontroller in order to know the project status locally. The SIMCOM GSM modem is used here to establish the network connectivity and to transfer the data to the internet so that the status of station can be viewed from anywhere[12].
3. DESIGN METHODOLOGY

The above figure 2 describes the entire circuit diagram of this project “Solar Based Charging Station for E-Vehicle”.

4. MODELLING PARAMETERS

A) POSITION TRACKING

Solar panel is a semiconductor device that converts the sun's rays as they reach it. With respect to weather, sun’s position changes day and night. Materials used to make Solar Panel is monocrystalline silicon so it must be handled carefully otherwise it can break and size of single cell in panel is small with a frame made up of Aluminum in order handle it more efficiently and to support the cell’s structure in panel which makes it quiet efficient to adjust and rotate it when needed. Many individual solar cells combine to form a solar panel [13]. Individual cells are series connected to make panel. The effects of Solar panel are (i) Due to antagonistic connections of individual cells can make a losses.(ii)Temperature of Module, (iii)The system method becomes ineffective. A device is used to detect light is Photocell or LDR. The solar panel is aligned in the direction of sun’s rays touching LDR by a Geared DC motor [14]. The Photoresistor is located in a path where the sun's rays are too high. The LDR sensors are located on the left and right sides of the solar panel. The solar panel is rotated by a Geared DC motor. The Geared DC car plays an important role in aligning the solar panel with the help of a Photoresistor [15]. Lighting has an effect on Photoresistor resistance as shown in Figure 3.
B) ARDUINO UNO R3
The ATmega328 microcontroller is used on the Arduino UNO R3 board. It has 14 visible input/output pins and a crystal oscillator with a frequency of 16 MHz. There is a jack jack and ICSP header and a reset button. In Italian, the word "uno" means "one." The most advanced Arduino version of the series will be the UNO version as shown in Figure 4.

I.0. Next on the line of USB Arduino boards, Uno. The active power is 5 volts, but the recommended voltage is 10 volts, the input power varies from 7 to 12 volts. The Arduino board may become unstable if the voltage is less than 7 volts, and if the voltage is more than 12 volts, the voltage regulator can overheat and damage the board. The ATmega328 is the latest Arduino model in use. Arduino UNO R3’s flash memory is 32KB, but almost 2KB in RAM configuration. EEPROM is 1KB in size and clock frequency is 16MHZ.

C) TRANSFORMER
A transformer is a dynamic electrical system that transmits electricity from one electrical circuit to another, or multiple circuits [16]. The current variation in any single transformer coil reveals a different magnetic fluctuation in the transformer core, resulting in different electromotive forces across all other coils around the same core. Electrical power can be transferred between different coils without conductive contact between two circuits. Faraday’s induction law, discovered in 1831, describes the effect of voltage on any coil due to a change in the magnetic field surrounding the coil as shown in Figure 5.

D) DRIVES FOR MOTORS
The motor drive is a device that amplifies and regulates the motor’s operation in either direction. The location of the solar panel monitoring on the left or rightside affects driving efficiency. It can also transform low current signals from circuits (such as solar panels) to high current signals [17-20] The solar panel is situated built on the angular form of the sun's rays or the top rays. The rotation is started by the motor drive. In addition to the functions, a potentiometer may be used to monitor the total discharge power from top to bottom or vice versa to meet the changing requirements. The circuit's...
aim is to transform a low current signal into a high current signal.

E) Description of LCD

Full form of the LCD is Liquid Crystal Display, and it works by blocking rather than emitting light. It has the distinct benefit of consuming less energy than LEDs (Light Emitting Diodes). Light that is diffused from the lens to a sheet of liquid crystal is made up of multiple layers that comprise two different panel filters and electrodes. A vibrant image is generated by combining coloured light with a grey crystal image (created by an electric current flowing through the crystal). The current used must monitor the image shown on the screen and on the LCD. It’s best to use bright lighting. The water crystal must be capable of controlling both transmitting functions as well as modifying the segregated light. As a result, a weighted and unpredictable signal is projected on the Liquid crystal screen.

F) DESCRIPTION OF ACS712

Sensitivity and regulation of current flow is a basic necessity for a various applications that can reliably detect current AC or DC, such as current safety circuits, charger for batteries, power switch mode, optical watt metres, scheduled current sources, and so on.

5. WORKING OF MODULE

Since the solar PV array is the most important part of a project, the model simply uses Photoresistor flashlights to monitor the source of the energy source, allowing for continuous power flow. Since the angle of the sun’s inclination may range from 0 to 180 degrees, two sensors should be installed, one on the left and one on the right. To prevent failure of hysteresis, all DC-DC suspensions should be turned on when cell activity exceeds the planned effect. Initially, the DC-DC converter accepts DC input power and delivers the output as DC power to the next level or lower or higher depending on the output power to match the electrical power required in the module. Replacing a simple DC-DC conversion circuit will monitor the link and disconnection from the feed to the load. Provides battery with DC power supply. The output can be adjusted by properly setting the external resistance separator and running the distance from 0.8V to VIN. Input power ranges from 2.7 to 5.5V. Frequency switch set to 1.4 MHz To prevent technical problems, voltage is transmitted to Arduino analog input frequently. The meter should help keep the electricity stable stable. As an analog signal, the Arduino UNO R3 board microcontroller with 20 and six digital inputs can be used. Next, a simple Arduino system can be used to download a tracking device, distribution, and demonstration of appropriate power output. It has a wide support team, which makes it a great way to get started with technology, and the Arduino R3 is the most recent magazine. On the other hand, features such as a plug, a battery power sensor, and a car driver make it easy to avoid congestion or to transmit disruptive errors. A two-point potentiometer of an electrical circuit in a body signal equal to the power supply obtained as a digital input in Arduino over time creates a battery power sensor. The potentiometer is designed to rise as a fixed output when the sensor detects a decrease in output, and can also decrease by increasing this output. Depending on the location of the LDR light switch to the sensor, the vehicle displays the circuit price movement and vehicle switching direction. The car appears to be rotating on the side of the clock when the torch is held straight on the left side, and similarly when the torch is held straight on the right side. An L293 driver that drives two engines simultaneously to make it easier to keep Photocell’s sensory signals easier. It is easy to keep the two sensor signals synchronized. It has an automatic hot switch, which ensures that if the chip is too hot, it will shut down. As a result of the entire electrical circuit process, the LCD displays the actual output from Arduino. The LM016L is a basic LCD that can be used with a variety of microcontrollers. Some Arduino features help erase and refresh with a new look for battery power. Slope (right or left), real-time battery power, and whether the car is turned on or off should all appear on the dashboard. Until the LCD can be used for display purposes, it sends a set of LCD startup commands internally.
6. HARDWARE IMPLEMENTATION

The above figure 6 represents the hardware implementation of “IoT Enabled Photovoltaic Charge Station for Electric Vehicles” in which all the parameters are monitored locally with the help of 16X2 LCD Display and monitored remotely with the help of GSM modem by enabling TCP/IP protocol. It represents the value of light intensity in the north direction and the south direction. Additionally, the amount of power generated by the solar panel and the load consumption also being displayed in the 16X2 LCD display. The over load indication is seen in the 16X2 LCD display and hence buzzer is activated.

Figure 7. Cloud Integration of Load Monitoring

The above figure 7 represents the cloud integration through TCP/IP protocol. In the figure 7 it is clear that load ampere reading are continually monitored in the remote panel.

Figure 8. Cloud Integration of Solar Monitoring.

The above figure 8 represents the amount of power generated by the solar panel in the think speak server.
A) Formula

Daily watt-hours = Solar panel watts x average hours of sunlight x 0.75

Example: Solar panel watts-250 watts, one hour, then Daily Watt-Hours=187.5 watt-hours. If we have a 12V battery it may require 1200-watt hours from the solar panel to fully operate, so it is in good condition 6 hours and 24 minutes is required for full charge. A standard electric car (60kWh battery) takes less than 8 hours to charge from empty and full with a 7kW charging point. Most drivers charge an extracost rather than wait for their battery to cool down. For most electric cars, you can add up to 100 miles in 35 minutes with a 50kW fast charger. If your car’s battery gets bigger and slows down the charging point, it takes longer to charge from empty to full. Nissan LEAF (2018) - 40kWh battery can take up to one hour to charge from zero to 100 percent on a charging station that transmits 43KW-50KW.

7. SIMULATION DIAGRAM

The above figure 9 represents the amount of load connected to the battery and its ampere rating is monitored in the 16x2lcd display.

The above figure 10 represents the value of power generated from the solar panel and the solar panel motor fixed for tiling angle is moving towards north direction as the light intensity from the north LDR sensor is more when compared to south direction LDR.
8. CONCLUSION

Thus, by using this project the maximum power is derived from the solar panel through multiple axes and hence the power utilized from the grid source is reduced drastically in order to save nonrenewable power source. Additionally, the power generated from the solar panel and power consumption of the solar charge station is made available in the cloud server for monitoring and tracking purposes.

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