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# DC Solar System for College and Commercial Applications

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**ABSTRACT:** This becomes very inconvenient for people on the road or occupied with work. In order to recharge the phone, people must bring wall phone chargers. The newest technology of solar phone chargers is a separate device that uses a small solar panel to absorb light and then transfer to the phone. This process still forces customers to carry around another device along with their cell phones. Solar home lighting system has been boon for the people of rural areas. On the other side it has also affected the life of the people living in metro cities all around the world. The Objective of this paper is to solar based charge the mobile wirelessly and light, fan control automatically using embedded system.

**KEYWORDS:** Wireless Charging, Mobile Charger, DC Solar System.

## I. INTRODUCTION

Solar energy is a very environment-friendly power source and one type of renewable energy. Besides that, the charge controller makes it more efficient for use as it gives the necessary maximum power to the battery or appliances. Solar panel uses photovoltaic cells that convert light energy from the source of light into electricity. This renewable energy can be used for various purposes, i.e. to run the home appliances, to operate machines and motors. In this study, solar power is used to charge batteries wirelessly. Wireless power transmission system follows the rules of inductive coupling by Faraday's laws. Where transmitting power is converted into high frequencies AC current that is sent to a transmitter coil for which magnetic field is created. The same magnetic field produces current within the receiver coil. This current is converted into usable DC current. Normally wired charger charges batteries but some devices such as, electric toothbrush which is not suitable for a wired charger. Mobile phones can also be charged by wireless, charger station can offer this type of feature.

The solar or photovoltaic system is a very effective energy resource that has established a great impact on the society and industries. In remote areas, it is quite difficult for people to charge their devices because of unavailability of electricity. With this proposed system, it is possible to charge any device without electricity. In this study, an inductive coupling has been used which creates a magnetic field between two objects and transfers energy from source to receiver. With this energy, the battery can be charged without any physical connection.

## II. RELATED WORK

Transmitting power through a wireless system was invented by Faraday. His research was about current conduction in the wire. If current flows through one wire of a conductor then another wire near to it will gain some current as well. For this, the second wire has to be placed very near to the current carrying wire. This principle was developed by Tesla who built towers to transmit power through the entire world. But the project was unsuccessful because his sponsor discontinued providing financial support for the transmission. The reason for this was, the experiment results were not satisfactory [1].

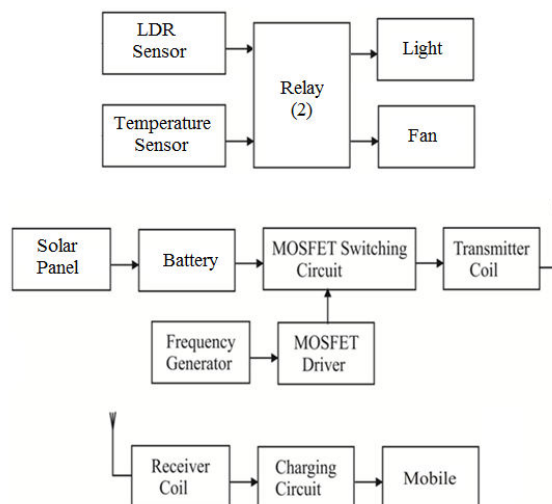
Many research works has been done for wireless power transmission. A wireless sensor network along with a charging car can increase the lifespan of a network with the help of wireless power conversion technology. The wireless energy can be radiated in every direction as well as a specific direction. So, the charging model can be divided into two model, point-to-point and point-to-multipoint [2].

An ideal case was first mentioned by assuming zero traveling time for the charger. A provably near-optimal solution was obtained based on the discretization and logic point representation techniques. Finding the shortest Hamiltonian cycle helps to discover the moving path of the original problem. A feasible solution is derived with this moving path [3].

Research had been done in the same field and the proposed device's efficiency was very high [4]. In a project named "Automatic wireless mobile charger", the researchers tried to develop a better device to deliver power wirelessly [5]. One more study states that mobile will be charged automatically and wirelessly through radio frequency harvesting [6]. The demand for fossil fuel is increasing day by day. An electric vehicle, developed by wireless technology can lessen the use of fossil fuel [7].

A wireless remote control system is applied for protection of the linear generator where the electrical power is supplied from a solar panel connected with a battery and a charger [8]. Another automatic portable grass cutter machine is proposed in which a solar panel, a charger and a battery are used for power supply [9]. In recent years, it has been proved that electricity can be transferred at a distance of about two meters. The efficiency of this technology is 40% where 60% power was wasted. Later, the efficiency has been improved.[10]

### III. PROPOSED ALGORITHM



Block Diagram of Proposed System

#### A. Solar Panel:

A **solar panel (photovoltaic module or photovoltaic panel)** is a packaged interconnected assembly of solar cells, also known as photovoltaic cells. The solar panel is used as a component in a larger photovoltaic system to offer electricity for commercial and residential applications.

#### B. Battery

An electrical **battery** is one or more electrochemical cells that convert stored chemical energy into electrical energy. Since the invention of the first battery (or "voltaic pile") in 1800 by Alessandro Volta, batteries have become a common power source for many household and industrial applications.

#### C. Temperature Sensor:

Thermistors differ from resistance temperature detectors (RTD) in that the material used in a thermistor is generally a ceramic or polymer, while RTDs use pure metals. The temperature response is also different; RTDs are useful over

larger temperature ranges, while thermistors typically achieve a higher precision within a limited temperature range [usually  $-90^{\circ}\text{C}$  to  $130^{\circ}\text{C}$ ].

#### D. LDR

A photoresistor or LIGHT DEPENDENT RESISTOR or cadmium sulfide (CdS) cell is a resistor whose resistance decreases with increasing incident light intensity. It can also be referred to as a photoconductor. A photoresistor is made of a high resistance semiconductor. If light falling on the device is of high enough frequency, photons absorbed by the semiconductor give bound electrons enough energy to jump into the conduction band. The resulting free electron (and its hole partner) conduct electricity, thereby lowering resistance.

### IV. CHARGING CIRCUIT

In a charging circuit, a current correcting circuit is provided which includes a transistor, the collector current of which is permitted to flow through a resistor for setting up a reference voltage for a comparator circuit. The current correcting circuit is arranged such that when the output voltage of the charger goes below a predetermined level, the transistor is rendered conductive to compensate for the decrease in the reference current, thereby preventing the current from being decreased which flows through the resistor of the comparator circuit.

Charging current is provided by a regulated source of current, and both the voltage and the current output of the regulator is monitored by a control circuit. The actual voltage on the battery is measured as an indication of the state of charge, and when the rate of voltage change decreases, indicating the approach of a fully charged condition, the charging operation will thereafter be terminated.

This invention differs from the prior art in that the battery voltage is averaged over a period of time sufficient to ensure that momentary variations in the charger output voltage as well as ripple and other line noises are effectively filtered out, and that several consecutive average voltage measurements of less than a predetermined voltage are required before the charging operation is terminated.

In the preferred embodiment of this invention, an averaging analog to digital converter provides a digital output representative of the average battery voltage taken over a predetermined interval of time. The average voltage is then monitored at regular intervals, and the current reading is compared to a previous reading. If a predetermined number of consecutive comparisons reveal that there is a change in battery voltage of less than a predetermined amount, then a control signal is generated to disconnect the source of charging current to the battery.

### V. RESULT

This project is used to transmit the power using wireless and to turn ON LED's or to charge the battery after receiving power wirelessly. This project proved that can be transmitted without conductor. This project is first step to the power. The principle of the development of science is that "nothing is impossible". So we shall look forward to a bright & sophisticated world.

### VI. CONCLUSION AND FUTURE WORK

The progress in science & technology is a non-stop process. New things and new technology are being invented. As the technology grows day by day, we can imagine about the future in which thing we may occupy every place.

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