RESEARCH ARTICLE OPEN ACCESS

Integration of Solar Renewable Energy Source with Dynamic Wireless Power Transfer in Recharging IR Based Receivers

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ABSTRACT
We consider a common scenario where the charger travels along a pre-planned trajectory and determine the optimal velocity of the charger subject to a given traveling time constraint, such that the network lifetime is maximized. Specifically, we aim to maximize the minimum charged energy among all nodes in the network. This paper tells us benefits of using WPT technology specially by using solar based power satellites. we construct a Robot which is charged using Solar panel, Wireless Power Transmitters & IR Sensors are connected with it and starts transmitting the Power wirelessly by identifying the receiver based on IR Sensors. Even Mobiles can also be charged. Robots are controlled Mobile. Charging info are transmitted to the server via mobile.
Keywords: — Solar Panel, Wireless Power Transmitter, IR sensor, DC Battery Micro Controller , LCD Display.

I. INTRODUCTION

In order to reduce the pollution in environment and avoid extensive use of energy supply we introduce the alternative energy source and new ways to recharge the electronic and electrical devices using solar energy source with wireless power transfer(WPT) through IR sensor which is more efficient and cost effective. Transmission and distribution losses can be reduced using wireless power transmitter(WPT).

1.1Existing System

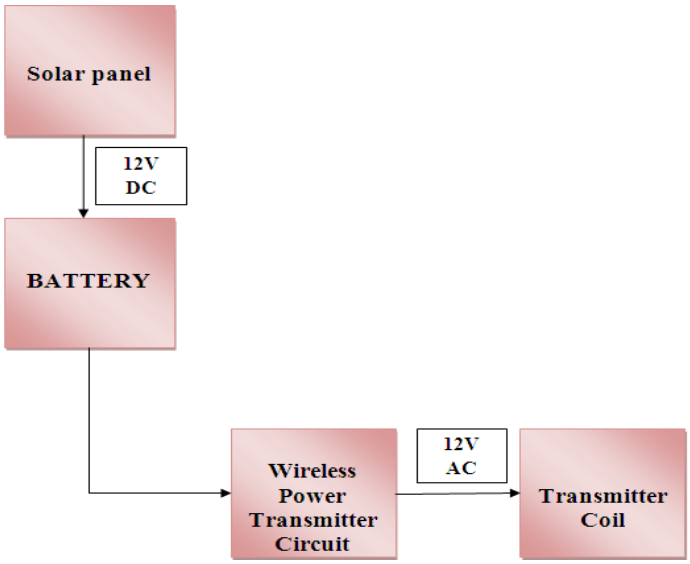
In the existing part, limited energy at each node in wireless sensor networks (WSNs) is known to be the major hurdle in their design and operation. Wireless power transmission is still in a research process.
The network lifetime of each node is very less and there is a 70-75% transmission and distribution losses. More radioactive element is present in this system and it is hazardous to the human during the transmission.

1.2 Proposed System

In the **proposed** part, we construct a Robot which is charged using Solar panel, Wireless Power Transmitters & IR Sensors are connected with it and starts transmitting the Power wirelessly by identifying the receiver based on IR Sensors. Even Mobiles can also be charged. Robots are controlled

Mobile. Charging info are transmitted to the server via mobile In this paper we have maximized the network lifetime of each node and it is very eco friendly to the environment by using the natural resources.

Transmitter Module:



Vehicle Module:

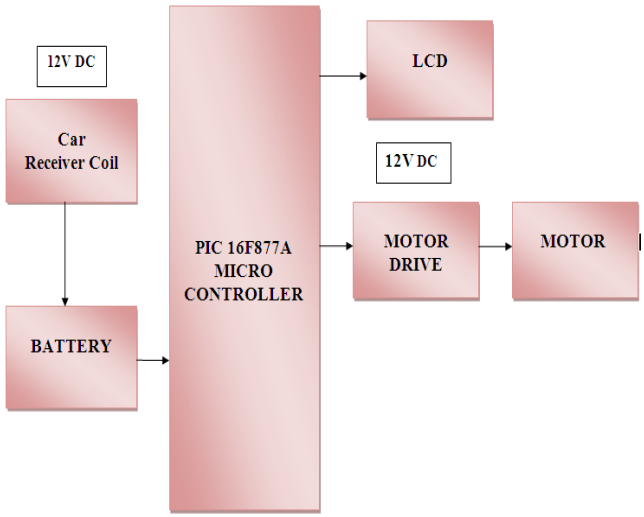


Figure 1: Block Diagram

III. SYSTEM MODEL

The system was designed with solar panel, Transmitter coil, DC power supply and receiver coil. Solar Panel have been placed over the movable Robot and wireless power transmitter(WPT), IR sensors are connected to it.

A. Solar panel

Solar Panel is designed to absorbs the sun ray's which convert sunlight into electricity for the purpose charging electrical devices and save it to the dc power supply which is shown in the figure 2.

Figure 2: Solar Panel

B. Wireless Power Transmitter

Wireless Power Transmitter can be used to transmiting power wirelessly from source of power to electrical devices which is consuming without the use of artificial cables or any human sources which is shown in figure 3.

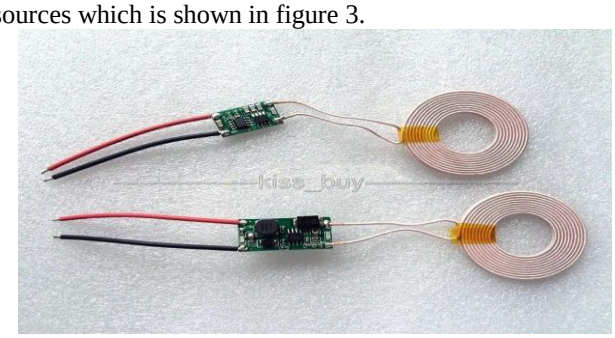


Figure 3: Wireless Power Transmitter

C.DC Power Supply

DC power supply is a device that can be used to supply electric current which takes the energy from solar panel and deliver it to the receivers such as electrical devices. Direct Current is an straight opposite to Alternate Current which is shown in figure 4.

Figure 4: DC power supply

D.IR Sensor

IR Sensor can be used to tracking the moving receivers within the fixed range which is connected with solar panel. when the receivers are in out of range, sensor immediately stop its charging process and its service automatically. so it is very efficient and it is used in many real time applications by creating smart environment which is shown in figure 5.

Figure 5: IR Sensor

E.LCD Display

All components are integrated into microcontroller and the final output must be displayed in LCD screen.The main purpose of LCD display to check whether the battery gets charge or not which is shown in figure 6.

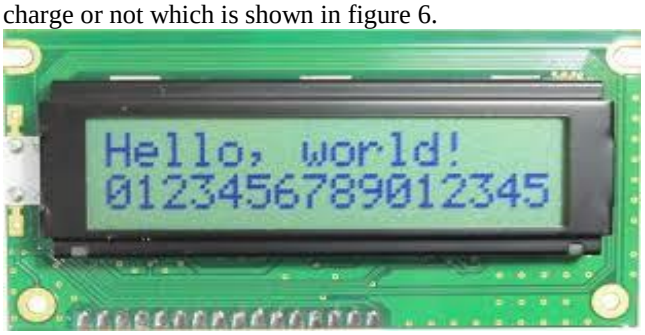


Figure 6: LCD Display

II. CONCLUSION

In this paper, we studied the problem of maximizing network lifetime in a general scenario, where a charger travels through a predefined arbitrarily-shaped trajectory and charges the randomly deployed sensor nodes in a WRSN. We formulated the main problem as a charger velocity control problem subject to the constraints of patrolling cycle and acceleration limit. A novel spatial-temporal discretization method was used for this NP-hard problem and a suboptimal solution was proposed with some provable performance bounds. We then simplified the charging path to a linear trajectory that represents many real wireless

charging applications and derived the optimal results. Finally, we conducted extensive simulations to evaluate the performance of the proposed algorithms.

The results demonstrated that the proposed velocity control mechanism achieves 2:5_ network lifetime extension compared to the baseline method.

As part of our future research direction, we are extending the charging model to non omni directional one. In addition, joint optimization of moving trajectory and velocity is also worth investigating.

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