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Solar Wireless Electric Vehicle Charging (Dynamic Charging)

Prof. Harshalata Toke[1], Sagar Bhosle[2], Manisha Mane[3], Sujit Talekar[4]

Dept. Electronics And Tele-Communication, Gennba Sopanrao Moze (*GSMCOE*), Pune, Maharastra, India

ABSTRACT

Electric vehicle charging is made easy and environmental friendly with the Solar Wireless Electric Vehicle Charging System, a cutting-edge invention. The electricity produced by this technology is wirelessly delivered to the electric vehicle to be charged using solar radiation. The system consists of solar panels, an electric car receiver, a wireless power transmitter (copper coil) under road, and an inverter. The power inverter transforms the DC electricity produced by the solar panels from the sun's energy into AC electricity. The wireless power transmitter wirelessly transmits AC current to the electric vehicle's receiver (copper coil), which charges the battery. Compared to conventional electric vehicle charging methods, the Solar Wireless Electric Vehicle Charging System has a number of benefits, including being ecologically friendly.

Keywords: NODE MCU Esp8266 , Solar panel , Copper coils , Transistor , Diode , LI-ION Battery (2) , Transformer, Led, Power bank Module.

INTRODUCTION

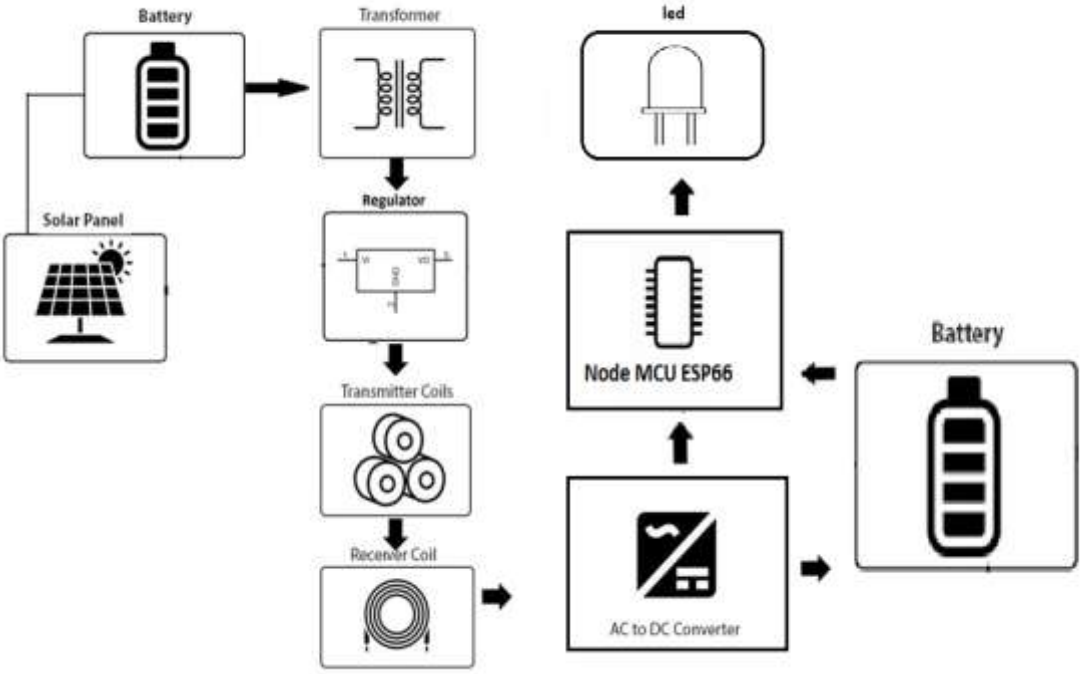
As more people become aware of the environmental advantages of utilizing electric vehicles as opposed to conventional petrol vehicles, the popularity of electric vehicles (EVs) is rising. Unfortunately, a shortage of infrastructure for charging EVs prevents their broad adoption. Researchers are striving to create wireless electric car charging systems that can offer more practical and effective charging methods in order to solve this problem. The use of wireless charging devices has the potential to transform how EVs are charged by making the procedure quicker and more practical. The most recent innovation in EV charging is wireless electric vehicle (EV) charging systems, sometimes referred to as inductive power transfer (IPT) systems. Wireless EV charging systems transmit electricity between the charging station and the EV's onboard receiver using an electromagnetic field, in contrast to conventional EV charging systems that require cables and plugs. As there is no longer a requirement for physical connections, it is more practical, secure, and effective. A promising innovation, wireless EV charging systems have several benefits, including easier access to charging stations, less maintenance, and better user experiences. Wireless EV charging systems are gaining popularity as the demand for electric vehicles rises because they provide a more practical and effective way to charge EVs. There are several coils inside the ground-based charging plate or pad that are wired to a power supply. An electromagnetic field is produced around the pad or plate when power is passed via these coils. The positioning of the receiving coil on the vehicle's underbelly allows it to detect the electromagnetic field produced by the charging station. This causes an electrical current to flow through the receiving coil, which is subsequently utilized to recharge the electric car's battery. Here transmitter and receiver each consist of armature winding and synchronized permanent magnets inside the winding. At transmitter side operation is similar to motor operation. When we apply the AC current to transmitter winding it induces mechanical torque on transmitter magnet causes it's rotation. Due to the magnetic interaction change in transmitter, PM field causes torque on receiver PM which results it's rotation in synchronous with transmitter magnet. Now change in receiver permanent magnetic field causes the AC current production in winding i.e, receiver acts as generator as mechanical power input to the receiver PM converted into electrical output at receiver winding. The coupling of rotating permanent magnets is referred as magnetic gear. The generated AC power at receiver side fed to the battery after rectifying and filtering through power converters.

Related work

We distribute our according to which individual have there interest and know better about this(related task)
Author{1}have task to Publish paper and making block diagram.
Author{2}have task to make PPT
Author{3}have task to make report

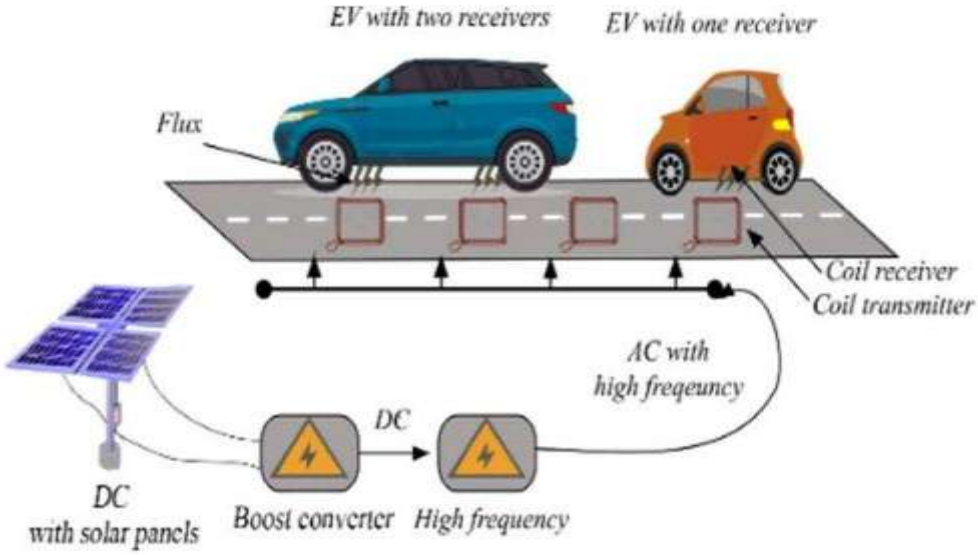
After all this , we together make our project hardware.

BLOCK DIAGRAM



Proposed algorithm

The operation of the transformer and wireless charging are the same. There are transmitting coils and receiver coils used in wireless charging. Through AC/DC and DC/AC converters, the 220V 50HZ alternating current of the electrical grid is converted into high-frequency alternating current, which is sent to the transmitting coil. Create alternating magnetic flux, disconnect the receive coil , and have the receiver coil combine the AC output. Maintaining the resonant frequency of the transmit and receive coils is important for good wireless charging, so balancing is present on both sides to control the resonant frequency. A battery management system (BMS) or battery pack is used to power the battery, and at the receiver side, AC power is converted to DC power.



Pseudo code:

Copper coils are high-voltage transformers that are often used as transmitters for wireless power transmission. The Copper coil is a resonant transformer, the primary and secondary LC circuits are only loosely connected. We use it as a transmitter because it's a transformer but it works differently than a normal transformer, it gives us a lot of power and a high-frequency output that produces more induction on the load side. Copper coils use a high-voltage generator to charge a capacitor (called a primary capacitor) and temporarily store the charge. When the capacitor is fully charged and connected to a special switch called a gap, the air between the electrodes is ionized, producing electricity. Primary capacitors can be connected in series and parallel, the difference between and is between the primary capacitor and the primary coil, and the other end of the capacitor is connected to the high-voltage generator. The RF ground is at the other end of the first coil Copper coils are high-voltage transformers that are often used as transmitters for wireless power transmission. The Copper coil is a resonant transformer, the primary and secondary LC circuits are only loosely connected. We use it as a transmitter because it is a transformer but it works differently than a normal transformer, giving us more power, and more frequency output, which has a greater impact on the cargo. Copper coils use a high-voltage generator to charge a capacitor (called a primary capacitor) and temporarily store the charge. When the capacitor is fully charged and connected to a special switch called a gap, the air between the electrodes is ionized, producing electricity. Primary capacitors can be connected in series and parallel, the difference between and is between the primary capacitor and the primary coil, and the other end of the capacitor is connected to the high-voltage generator. The RF ground is at the other end of the first coil.

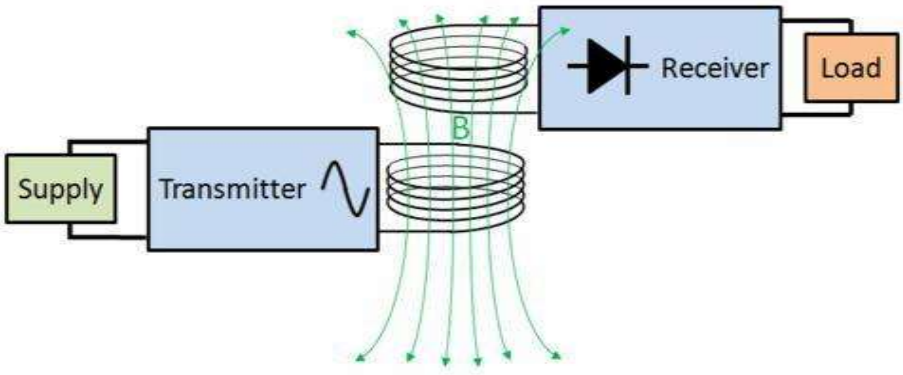


Figure:- (Wireless Transmission)

Simulation Results:

Wireless power transfer for electric car using NODE MCU ESP8266 microcontroller can be done by different methods such as inductive coupling or resonance coupling and power MOSFET circuit with primary and secondary coil works well. The results of this project will depend on characteristics such as efficiency, range and power transfer capacity, as well as specific usage and design options. It is important to consider the safety, EMI, and overall performance of the system. The result will depend on the success of hardware integration, firmware programming, energy storage for the EV battery on both sides where the coils are energized, and this car is solar powered, both wireless and solar energy is stored in the battery. Another explanation of the project is how long the battery lasts. This process will be done with the operation of the NODE MCU ESP8266 microcontroller.

RESULT & DISCUSSION

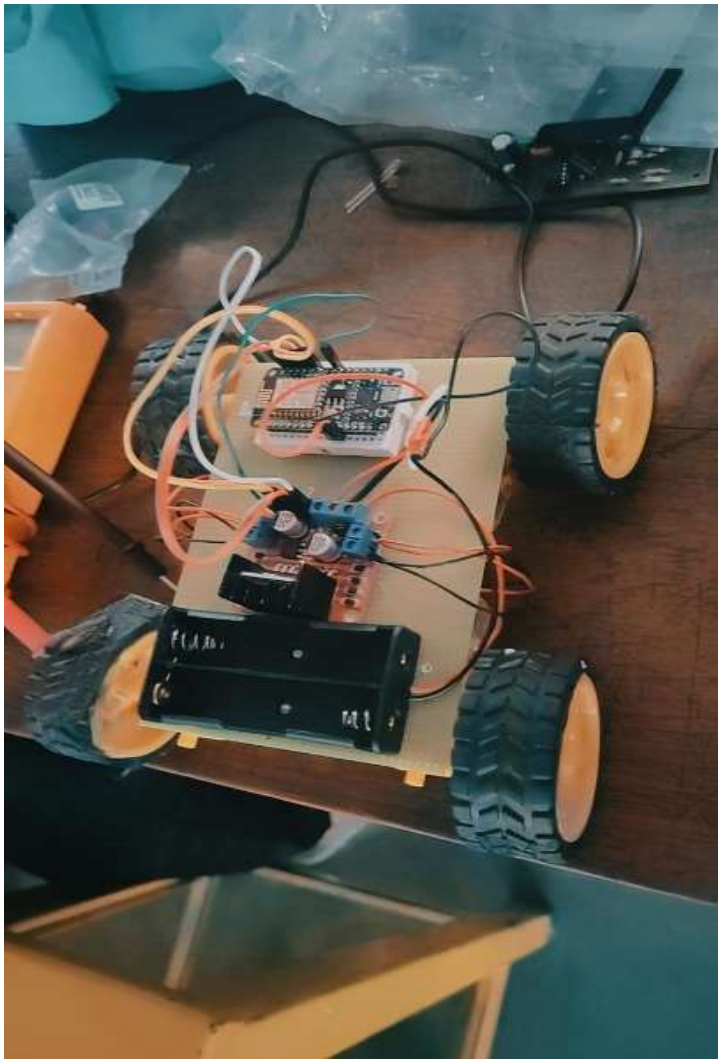


Figure 1

CONCLUSION

The solar wireless electric vehicle charging system, in summary, is a promising innovation that has numerous advantages over conventional cable charging methods. Large dependency on fossil fuels and enables quick and easy charging of electric vehicles without the use of bulky wires or connectors. A clean and renewable source of energy, the solar panel on the charging pad can generate electricity by using the sun's energy. Since there is no need for physical contact during the wireless power transfer between the charging pad and the vehicle, there is less chance of electrical hazards and damage to the charging cables. The battery is charged securely and effectively thanks to the employment of an NODEMCU ESP8266

microcontroller and other electronic components, which enables efficient and intelligent management of the charging process. Drivers can track the development of their charging session thanks to the LED charging indication and display, which provide clear feedback on the vehicle's charging status.

- The city and country should prepare to have electricity in the future. It is based on the instructions of the authorities and the latest technology. Offering the best performance, safety, and economy, electric vehicles have the potential to change the way transportation.
- Dynamic electric car charging is essential; The technology could also power biomedical implants, enable supersonic hyper loop travel, and create humanoid robots. The opportunities offered by business problems are limitless.

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