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Wireless Power Transmission for Charging Nearby Devices

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Abstract: ***Wireless Charging is an emerging technology. It transmits electricity primarily through an air gap for various electrical appliances for energy replenishment. Basically, attempt to make the charging process easier and user-friendly, by removing the physical cable connection between the mobile phone and the cable. The need for wireless field has increased because it has great advantages such as user don't has to carry a mobile charger with it, there is no need to keep the mobile device near the charging socket as the length of the wire is low. Mobile operators are working to develop the mechanism to reduce power consumption in mobile devices but unfortunately, the reduction was not enough. Early adopters of wireless power are Verizon, AT & T, NTDTokomo, SoftBank and KDDI. The purpose of this letter is to present a brief idea on wireless power transmission as well as to present its future research area.***

Keywords: ***Wireless Power Transmission (WPT), Inductive Power Transfer (IPT), Inductive Coupling, Energy Replacement, Mobile Device, wireless energy transfer.***

I. INTRODUCTION

Technical and theoretical consideration behind offering wireless charging initially in the 1890s Nikola Tesla was suggested by [2]. However, in the last decade, technology has been exploited at the point where it presents real world applications. Wireless power is commonly known by various names like Inductive Power Transfer (IPT), Inductive Coupling and Resonant Power Transfer (RPT). A similar basic process is essentially described by these conditions for the transmission of energy from a power source to an electrical load without the connectors at an air gap. The work of the wireless power system is outlined in the sections given below.
Figure 1 shows that even at that time the technique was advanced but the scope and spectrum were somewhat limited. The same legacy continues but with the names of new innovators.
"Wireless Power Transfer technology is becoming one of the most emerging and promising technologies with the most expected market impact in the mobile and automotive industries. It can be widely applied for commercial products including wireless charging for smart phones, note PCs, home appliances, automotive, and implanted medical equipment. This will enable us to get rid of uncomfortable wiring and charging overhead in battery-based operating system".

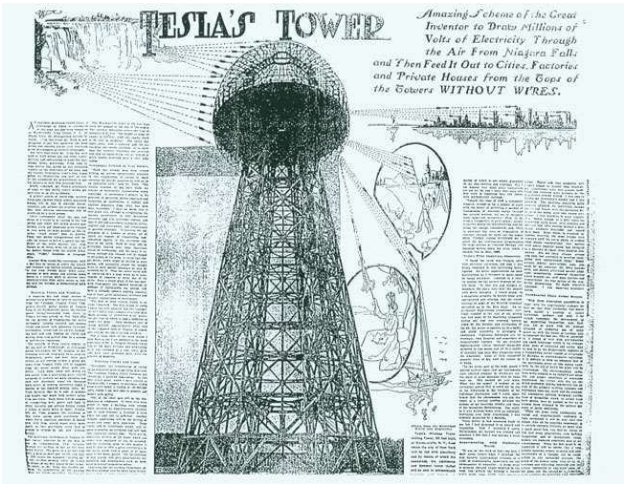


Figure 1: New York American, May 22, 1904: Tesla's Tower - Amazing Scheme of the Great Inventor to Draw Millions of Volts of Electricity Through the Air From Niagara Falls and Then Feed It Out to Cities, Factories and Private Houses from the Tops of the Towers Without Wires. Source: Google Images.

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II. WIRELESS POWER TRANSFER SYSTEM

In 1893, Nikola Tesla again strengthened the light of vacuum bulbs without using the wires for the transmission of electricity at the World Columbian Exhibition in Chicago. Figure 2 shows Wardencliff Tower. This was designed and manufactured by Tesla primarily for the wireless transmission of electric power. [3]



Figure 2: 1904 image of Wardenclyffe Tower located in Shoreham, Long Island, New York. Source: Wikipedia.

The original work of wireless power is transmitted from a transmitter to the receiver, which reaches the receiver through a magnetic field. is. To achieve this, the direct current (DC) supplied by an electric source is converted into high frequency alternating current (AC). The AC produces a copper wire coil in the transmitter generating a magnetic wire. Once a second receiver coil is placed within the bounds of the magnetic field, then it can induce an AC in the receiving coil. Summing up:

A. The voltage is converted to AC signal, which is later sent through the electronic transmitter circuit to the transmitter coil.
B. AC current flowing through the transmitter coil is a magnetic Inspires the area which can spread to the receiver coil (which is contained in relative proximity).
C. Magnetic field then produces a current which achieves The device flows through the coil The process of transmitting energy between the transmitter and receiver coil is also known as magnetic or resonant coupling and is achieved by both resonant coils at the same frequency. The stream flowing inside the receiver wire is converted into a direct current (DC) by the receiver circuit, which can later be used to power the device [4].

III. BENEFITS

Removing the connection of wireless power transfer provides many advantages over the traditional cable power connector and is mentioned below:

A. This reduces the cost associated with maintaining direct connectors.
B. It charges everyday electronic devices Provides more convenience to do.
C. It ensures secure power transfer for those applications that are sterile or remedial A need to keep a seal.
D. It reduces the risk of erosion because the electronics can be fully engraved.
E. Provides constant power distribution to this rotating, highly mobile industrial equipment.
F. Provides reliable power transfers in important systems like wet, dirty and dynamic environments.

IV. CONCLUSIONS

Any electrical distance can be transmitted electrically without any terrestrial distance, many researchers are proven both quantitatively and qualitatively in their observations, experiments and measurements. Wireless Power Transmission is the leading Nikola Tesla. During my study of many web resources and research papers, I found out about its many limitations. Limitations include:

1) Flux status should meet certain conditions and if not, no power supply will be provided.
2) High capital cost for practical implementation of wireless power transmission.
3) Microwave with current communication system Interference can occur.
4) Possibility of energy theft.

NASA's Dr. Neville “says that you do not need cables, pipes or copper wires to get electricity. We can send it to a cell phone call, where you want it, when you want it, in real time” .With the proof we can expect that in the next few years, miracle will be wasted due to all conditions, due to its applications.

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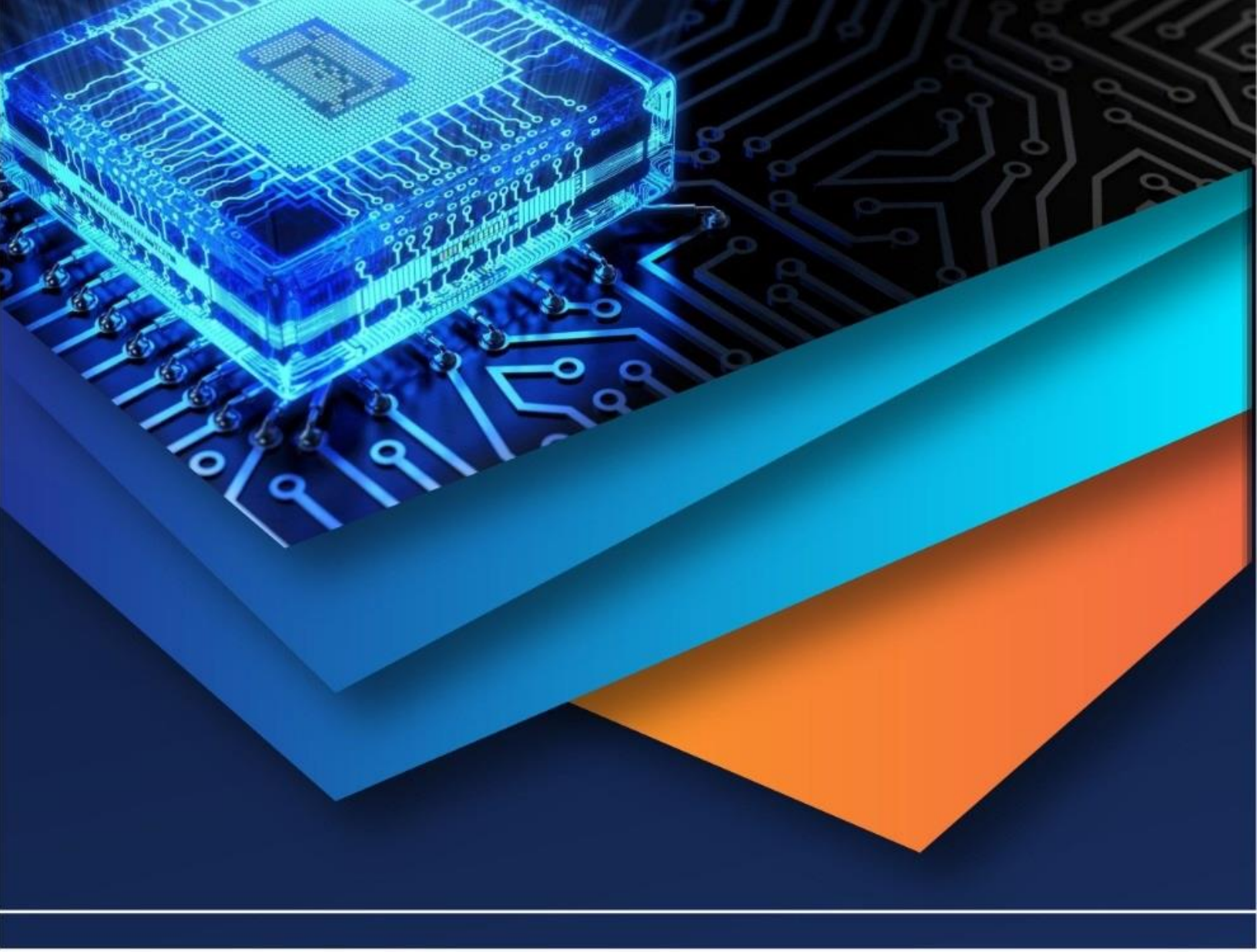
V. FUTURE

Studies of Future focus primarily on reducing the physical size of the antenna and embedded in mobile to give it high efficiency and less harm. Also designing a high level power transmission system to charge the laptop is a good work scope.

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