Title – Wi-Extend (Wireless Extension Cord): Extending Wireless Power Transfer

Program of Study – Engineering

Presentation Type – Choose one of the following: PowerPoint

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Category – Choose one of the following: Experimental (Applied)

Abstract example: This paper reviews and analyzes the results of research conducted on extending the range of Wireless Power Transfer (WPT), through the use of coupled resonant inductive coils. Wireless Power Transfer has two different methods of transfer which are non-radiative and radiative. Radiative wireless power transfer implements the use of lasers and microwaves which can have negative effects on the health of others, require a direct line of sight for transfer and transfers energy over large distances. Non-radiative energy transfer is done through the use of inductive resonance coupling or inductive coupling which has no known health risks, can transfer energy without a direct line of sight and transfers energy over small distances. Wireless Power Transfer has been a topic of intrigue for many years ever since Nikola Tesla introduced wireless power to the world in 1891. During this current period of time, a couple of engineers have continued the idea that Tesla started about wireless power transfer and have formed a company named WiTricity who have made WPT devices which can transfer power up to three meters with a 45% efficiency using inductive resonant coupling. In order to concentrate efforts on one type of wireless power transfer, this paper will focus only on extending the wireless power transfer and efficiency of non-radiative energy transfer through the use of inductive resonant coupling. At resonance, wireless power transfer is optimum and the highest power transfer that the circuit is capable of is performed. The research conducted for this

paper focuses on increasing the range of wireless power transfer while also increasing the efficiency of power transfer through the use of a wireless power transfer extender (WPTE) or a Wi-Extend. This paper will outline the materials and methods used to implement the WPTE and then analyze the data gathered from tests completed on the WPTE. This paper will mostly focus on an analysis of wireless power transfer efficiency over distances greater than three meters as well as those below three meters in order to compare the gathered results to established and expected outcomes.

Christian worldview integration: As a Christian it is important for me to help influence the world and God's creations in a positive way. Engineering provides an avenue for Christians to help others through innovation and technological skills. Through my belief as a Christian to help change the world through positive influence, wireless energy is the best way to help provide convenient power to the world. Wireless energy is a way of supplying energy without hassle and with convenience. There are many applications of wireless energy for consumer use and industrial use. My research has been inspired through my reflection on the Word which speaks on spreading knowledge and doing good works in all things we do. This research will be important and imperative to improving the efficiency and ease of energy transfer to electronic devices. Corded devices have limitations such as distance and restriction of location to which the electronic devices can be used. Wireless energy provides a release of that restriction and allows for multiple devices to be charged and used in a consumer or industrial setting. The Lord says that whatever we do, to do it with the best of our ability. I believe that God has implanted the will in me to pursue the idea wireless energy and with that, I will try with all my efforts to complete my analysis and research of the wireless energy extender in order to achieve maximum efficiency, maximize distance and to glorify God through my works. Innovation is the

cornerstone of engineering and the change that inspires new inventions. In the world of engineering, innovation comes at a price and it is through this engineers have learned that to rebuild you must first destroy. Destroy in this context does not have an overtly negative connotation but instead means the replacement of out-of-date methods and devices. Wireless energy plans to rebuild the energy field and destroy the outdated wired methods and devices.