An Investigation into Efficient Wireless Power Transmission

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This project aims to find the most efficient combination of components in the building of a wireless power transmission unit (WPT) using generated polynomial functions. In experimentation, the following variables are looked at and manipulated: coil diameter in both the transmitting and receiving coils, wire gauge in both the transmitting and receiving coils, the resistance in the primary circuit, and the rate at which the efficiency falls off. In testing each variable, all others should be kept the same for every single transmitting and receiving coil. As data is collected, it is to be input into a polynomial generator (BMHS_CurveFit) as to derive a function for the results that is able to predict an optimal construction for the tested setting. In order to obtain a number for an optimized setting, the first derivative of the function is to be taken and set to zero. The data should support the following statement: The transmitting coil built out of eighteen gauge wire with a primary resistance of about thirty thousand ohms is paired with a receiving coil with a diameter ten percent larger and built of the same gauge wire provides the most efficient power transfer. This trend is important because it provides insight into the efficient construction of WPT units that are able to be placed in devices such as pacemakers and cars that, as the size increases, the profit decreases.

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