Developing a Low Cost Prosthetic Battery Charger

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Myoelectric prosthetics are among the biggest advances in biomedical engineering in the last 25 years, but there are still many improvements that need to be made to optimize device efficiency. This low-cost prosthetic battery charger is engineered to meet that need with an affordable, sustainable solution that harnesses the energy from the vertical planar motion of the arm to recharge a nickel-cadmium battery. The recharging power is produced through an application of Faraday's law of induction, in which magnets are used to alter the flow of current through an electric wire. Two minute trial results showed that the recharging ability of this device produced a favorable work-to-output ratio of 1:9. The inspiration for this charger stemmed from many of the issues currently facing global society. For example, uprisings in the Ukraine region and the Middle East have left injured people in need of prosthetic devices using this exact nickel-cadmium battery. In the United States, we see many veterans receive myoelectric prostheses as well. As a US and a global citizen, I wish to help those that have lost limbs make a smooth transition back into their routine of life. I plan to trademark and open source this product, and let it serve as a building block for the engineering community.

Awards Won: