

# 9<sup>th</sup> Nano Congress for Next Generation

August 01-02, 2016 Manchester, UK

## Wireless power for body devices

Mary Mehrnoosh Eshaghian-Wilner, Nikita Ahuja, Zhuochen Ge, Renjun Liu, Alekhya Sai Nuduru Pati, Mike Schlesinger and Shu Han Wu  
University of Southern California, USA

Power supply has always been a bottleneck in the designs for both mobile systems and implantable medical devices. Wireless power transfer, however, is poised to revolutionize this paradigm. The history of wireless power transfer occurred in three periods. The first period involved theoretical analysis and equations given by Maxwell and Hertz. The second period was focused on the practical usage of wireless power transmission in aircraft transmitting power by Raytheon. The third period was the replacement of wireless power technology with renewable energy sources. There are three approaches for transfer of wireless power: the electromagnetic wave approach, inductive coupling, and magnetic resonance coupling. Using these three approaches as fundamental theories of wireless power transfer, additional approaches for further improvement have been developed. These approaches include winding resonant inductor, resonance frequency design, and magnetic resonance with human skin. Although many approaches are theoretical, there are practical standards of wireless power transfer followed in the industry. The two popular standards are the Qi standard and PMA standard. Qi standard uses small coil design to transfer power in higher frequency, and PMA standard uses a PCB board along with a chip. By combining past approaches for wireless power and existing technologies, engineers can quickly research and contribute to the future of this technology. Ultimately, wireless charging will be implemented in implantable devices and prove the potential of wireless devices in medicine.

## Biography

Mary Mehrnoosh Eshaghian-Wilner is an interdisciplinary Scientist and Patent Attorney. She is currently a Professor of Engineering Practice at the Electrical Engineering Department of USC. She is best known for her work in the areas of Optical Computing, Heterogeneous Computing, and Nanocomputing. Her current research involves the applications and implications of these and other emerging technologies in Medicine and Law. She has founded and/or chaired numerous IEEE conferences and organizations, and serves on the editorial board of several journals. She is the recipient of several prestigious awards, and has authored and/or edited hundreds of publications, including three books.

[eshaghia@usc.edu](mailto:eshaghia@usc.edu)

## Notes: