

Utah State University

DigitalCommons@USU

College of Engineering News

Colleges

9-26-2016

UPEL Students and Faculty Present at ECCE 2016 | Utah State University Power Electronics Lab

USU College of Engineering

Follow this and additional works at: https://digitalcommons.usu.edu/engineering_news



Part of the [Engineering Commons](#)

Recommended Citation

USU College of Engineering, "UPEL Students and Faculty Present at ECCE 2016 | Utah State University Power Electronics Lab" (2016). *College of Engineering News*. 129.

https://digitalcommons.usu.edu/engineering_news/129

This Book is brought to you for free and open access by the Colleges at DigitalCommons@USU. It has been accepted for inclusion in College of Engineering News by an authorized administrator of DigitalCommons@USU. For more information, please contact digitalcommons@usu.edu.



UPEL Students and Faculty Present at ECCE 2016 | Utah State University Power Electronics Lab

aechols

09/26/2016



UPEL students, Hongjie Wang, M. Muneeb Ur Rehman and Reza Tavakoli, presented their research papers at the annual IEEE Energy Conversion Congress & Exposition (ECCE 2016) sponsored by the IEEE Power Electronics Society (PELS) and the IEEE Industrial Application Society (IAS). The conference was held in Milwaukee, Wisconsin this year and was well attended by engineers, researchers,

students, and professionals from industry and academic world.

Hongjie presented his paper titled 'Design Considerations for Series Resonant Converters with Constant Current Input'. A copy of this paper can be accessed on IEEE Xplore. The paper emphasizes the group's research on design of the series resonant converters (SRCs) applied in dc current power distribution systems. The dc current distribution system can be applied in a variety of applications such as ocean observatory systems, subsea gas and oil fields and roadway wireless power transfer systems. The key challenge of designing an SRC with constant current input is that the control input may not be able to force the input voltage down at low power settings. The proposed design considerations overcome the barrier for a desired load range, and change the load range, in which the SRC with constant current input has the ability to force the input voltage down by designing the resonant tank parameters properly.

Muneeb, who was one of the recipients of student travel grant from ECCE, presented his paper titled 'Advanced Cell-level Control for Extending Electric Vehicle Battery Pack Lifetime'. The paper highlights research on cell-level control approach for electric vehicle battery packs that enhances traditional battery balancing goals to achieve significant pack lifetime extension. The proposed life control approach reduces growth in capacity mismatch typically seen in large battery packs over life while optimizing usable energy of the pack. The result is a longer lifetime of the overall pack and a more homogeneous distribution of cell capacities at the end of the first life for vehicle applications. A copy of the paper can be accessed on IEEE Xplore. Muneeb also showcased a hardware prototype of the cell balancing system at the conference.

Reza presented the paper 'Design of a Dual Loop Controller for In-Motion Wireless Charging of an Electric Bus'. This paper addresses Dynamic Wireless Power Transfer (DWPT) for Electric Vehicles (EVs). Limited onboard energy and power storage is identified as the main challenge toward successful implementation of Electric Vehicles (EVs). Emerging technology of DWPT offers an alternative solution for limited onboard energy resources through hybridization between vehicles battery storage and the power grid. In this paper, a dual controller is designed which has three main tasks; it energizes primary coils in the road successively based on the position of EVs. It controls the primary coil current at the reference value and finally control the amount of power transferred to the EV.