

Emerging Technologies for Electric Vehicles

by

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Abstract

Due to the crisis of energy and environmental pollution, electric vehicles (EVs) without any emission are very demanded and attractive, especially for the novel concept of smart and green city. As three core technologies of the EVs, the motor drive, traction inverter, and high power charger could be further optimized to enhance the reliability, flexibility, and convenience. In this seminar, the three emerging technologies for electric vehicles will be presented. Firstly, the desynchronizing scheme will be introduced for the traction inverter with multiple parallel SiC devices, which aims to alleviate the imbalance currents under high-power operation and reduce switching losses under light-load. The proposed method will be applied for a 180 kW electric drive system. Secondly, a new magnetic core design will be presented for the 55 kW wireless EV charger with a double D polarized pad. The new laminated Nanocrystalline ribbon core can help to enhance the magnetic saturation point, reduce the core loss, improve the thermal robustness, and compact the system size. Lastly, a new breed of motor drive will be introduced as wireless motor drives. By applying selective wireless power transfer and proper compensation network, the wireless motor drives enjoy the merits of converterless, batteryless, controllerless, and power equalization at the motor side.

Biography



Dr. Derrick C.Q. Jiang is currently a Postdoctoral Research Associate in the Electrical Engineering Division at the University of Cambridge, UK. He received his B.Eng. (2012) and M.Eng. (2015) degrees both in Electrical Engineering from Wuhan University. He received his Ph.D. degree in Electrical and Electronic Engineering from The University of Hong Kong in 2019. He was a Visiting Researcher at the Nanyang Technological University, Singapore. His current research interests include power electronics, electric vehicle (EV) technologies, electric machines and drives, and wireless power transfer techniques. As so far, he has authored/co-authored over 33 refereed journal papers as well as many conference papers and been with 12 patents granted. He received the first prize in the Interdisciplinary Research Competition and the first prize in the National Electronic Design of MXTronic. His PhD thesis was nominated for the best thesis of Li Ka Shing Prize.

Date : 5 November 2020 (Thursday)
Time : 3:30pm – 4:30pm
Language : English
Online Registration : Please register for the Zoom session [HERE](#)
: (*Please register with [EID]@cityu.edu.hk for email address.)

**** ALL ARE WELCOME ****