Master and Doctoral school Unit

« Sustainable Development Applications »

Monday 22 October 2018
14:00 – 16:00
P3-016 - University of Lille

Sustainable Development and Control of Electric Vehicles

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Abstract:

Although Electric Vehicles have a long history, they have been developed drastically in the last 3 decades to replace more and more conventional ICE (internal combustion engine) cars, due to the environmental pollution problems and the forecasted gasoline shortage. From the technical point of view, the most distinguished advantage of EVs over the ICE cars resides on the motor developed torque which can be controlled much more quickly and precisely than that developed by an ICE. By controlling the electric motor drive properly, we can develop the required traction force precisely, and increase the safety and comfort simultaneously. The most important issues of the EVs today are the energy storage systems and communication. Ultra-quick charging stations and wireless power transfer have attracted a lot of attention from research group in both academia and industry. The EVs in the future can be seen as agents in connected ecosystems, where the internet-of-vehicles (IoV) and energy exchange will be the key factors of innovation for sustainable development.

In the 1st part of the seminar, the control principle of different types of motors will be reviewed. Emphasis will be given to Vector Control (or Field-oriented Control FOC) of Induction Motors (IM) and Interior Permanent Magnet (IPM) Motors. Several advanced control algorithms will be presented. Various techniques of motion control of EV will be next addressed. The 2nd part of the seminar will focus on Energy storage systems and Charging technology. The wireless Power Transfer (WPT), both static and dynamic will be presented. In the 3rd part, prospective and future trends on EV technologies will be introduced, including Vehicle to Grid (V2G), Vehicle to Home (V2H) and Autonomous cars.

About the Speaker

Dr. Minh C. Ta received his Eng. Red Diploma in Czech Republic, Ph.D. degree in Canada, both in Electrical Engineering, in 1986 and 1998, respectively. From 1998 to 2004, he worked as post-doctoral researcher in Kyushu University and The Tokyo University; and as R&D Engineer in NSK Steering Systems, Japan. He is presently with Hanoi University of Science and Technology (HUST), Vietnam, where he works as Assoc. Prof. in Dept. of Industrial Automation and Director of Centre for Technology Innovation (CTI). His main research interest includes control of electric motor drive, power electronics converters and advanced control techniques, with applications to EVs, renewable energy. He received various Visiting Professor and Research position in Taiwan, Australia, France, Germany. Assoc. Prof. Ta is the author/co-author of 13 Japanese and 8 US patents. He is the recipient the Second Prize Paper Award of the IEEE Industrial Drives Committee in 2001, the 2012 Patent Business Contribution Reward of NSK Ltd. Co., Japan, the Nagamori Awards, 2017 and the Best Paper Award of the IEEE-VPPC'2018.
He was co-chair of SS on EMR in IEEE-VPPC 2015, 2016 and 2017 and General Chair of IEEE-ICSET 2016. He was general chair of the EMR'18 International Summer School, Hanoi, June 2018. He will be General Chair of the IEEE-VPPC'19, Hanoi, 14-17 October 2019.

More information: http://cti.hust.edu.vn/home