

Annual Conference of the IEEE Industrial Electronics Society (IECON 2021)

Special Session on

“Optimal Sizing and Predictive Energy Management Strategy for Fuel Cell Electric Vehicles”

Organized by

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Call for Papers

Theme:

Due to the high-efficiency and zero-emission properties, fuel cell electric vehicles (FCEV) have earned substantial attentions in the field of transportation electrification. A proper component sizing and energy management of vehicular hybrid powertrain is instrumental in maximizing FCEV's fuel economy and durability. Moreover, the integration of driving predictive information into energy management framework could help optimizing the outputs of multiple energy sources, contributing to the further mitigation of vehicular operating costs.

This special session is dedicated to the recent research progresses on the advanced methodologies for sizing and predictive energy management strategy of FCEVs, especially focusing on the application of data-driven approaches in estimating vehicle's driving conditions, the development of predictive energy management strategies and the co-optimization framework to concurrently accomplish component sizing and energy management tasks.

Topics of interest include, but are not limited to:

- Hybrid energy systems for automotive, robotic, aerospace and marine applications (e.g., fuel cells, batteries, supercapacitors, etc.);
- Data-driven approaches for driving condition prediction (e.g., speed prediction, driving pattern recognition, battery state-of-charge depletion planning, etc.);
- Predictive energy management and control strategies for fuel cell electric vehicles;

- Vehicular hybrid powertrain design and analysis (e.g., new topologies and control strategies);
- Co-optimization of sizing and energy management strategies;
- Hardware-in-the-loop and experimental implementations.

IES Technical Committee Sponsoring the Special Session: Transportation Electrification Technical Committee

Submissions Procedure: All the instructions for paper submission are included in the conference website: <https://attend.ieee.org/iecon-2021/>

Deadlines:

Full paper submission: June 25, 2021
Paper acceptance notification: July 30, 2021
Camera-ready paper submission: Aug 27, 2021

Brief introduction of the session organizers

Yang Zhou (yang.zhou@nwpu.edu.cn) received the B.Eng. and M.S. degrees in electrical engineering from Northwestern Polytechnical University (NPU), Xi'an, China, in 2014 and 2017, respectively, and the Ph.D. degree in electrical engineering from University of Bourgogne Franche-Comté (UBFC), University of Technology of Belfort-Montbelliard (UTBM), Belfort, France, in 2020. Since Feb. 2021, he has been an associate professor with School of Automation, NPU, Xi' An, China. His main research interests include model predictive control, energy management strategy and fuel cell hybrid electric vehicles. Dr. Zhou serves as the reviewer for many high-quality international journals, selectively including IEEE Transactions on Intelligent Transportation Systems, IEEE Transactions on Transportation Electrification, IEEE Transactions on Energy Conversion, Applied Energy.

Zhongliang Li (zhongliang.li@lis-lab.fr) received the bachelor's and master's degrees in electrical engineering from Tsinghua University, Beijing, China, in 2009 and 2011, respectively, and the Ph.D. degree in automation from the University of Aix-Marseille, Marseille, France, in Sep. 2014. From 2011 to 2014, he was a co-trained Ph.D. student with the Labs LSIS (UMR CNRS 6168) in Marseille and FCLAB (CNRS 3239) in Belfort, France. From 2014 to 2016, he was a Postdoctoral Research Associate with Labs FEMTO-ST (UMR CNRS 6174) and FCLAB (CNRS 3539), Belfort, France. Since 2016, he is an Associate Professor with Lab LIS (UMR CNRS 7020), Aix-Marseille University. His research interests include modeling, control, diagnosis, and prognosis with applications to fuel cell systems, electric vehicles, and other energy systems.

Ke Song (ke_song@tongji.edu.cn) received the B.S. degree in engineering mechanics and the M.S. and Ph.D. degrees in automotive engineering from Tongji University, Shanghai, China, in 2003, 2008, and 2013, respectively. From 2008 to 2010, he was a Ph.D. Exchange Student with the Karlsruhe Institute of Technology, Germany. Since 2013, he has been an Assistant Professor with the School of Automotive Studies, Tongji University. He has authored three books and more than 30 articles. His research interests include system modeling, simulation, control strategies, model-based optimization design, and alternative validation methods and processes of powertrain systems for pure battery/hybrid/fuel cell electric vehicles.

Alexandre Ravey (alexandre.ravey@utbm.fr) received the M.S. and Ph.D. degrees in electrical engineering from the University of Technology of Belfort-Montbelliard (UTBM), Belfort, France, in 2009 and 2012, respectively. Since 2013, he has been an Associate Professor with UTBM. He is currently involved in a Mobypost European Project aimed at building a hybrid electric vehicle based on fuel cell and batteries. His research interests include the energy management of electric and hybrid vehicles.