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Keynote Talk: Intelligent Monitoring, State Estimation and Charging Control of Li-ion Batteries

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Abstract

The global economy will be greatly shaped by the transformed energy landscapes. Battery storage systems play an important role in decarbonizing the whole energy chain from accepting renewable generations to electrification of transport and other sectors. The talk starts with an introduction of the energy storage systems for power systems and transportation electrification applications [1], followed by detailed presentation on some key technologies for battery management, including battery thermal and electrical parametric modelling, battery state estimation including internal temperature, state of charge (SOC) and state of health (SOH) [2-5], followed by a novel framework for battery state monitoring using fibre optic sensors [6], battery charging control [7-8] and integration of electric vehicles with power grid [9].

Keywords:

Battery management, monitoring, state estimation, parametric modelling, fibre optic sensing, charging control, V2G

Biography



Kang Li is the Chair of Smart Energy Systems at University of Leeds, UK. His primary research interest lies on the development of advanced modelling, control and optimization methods in the energy and manufacturing fields, including integration of renewable generations, electrification of transport (EVs and railway electrification), energy management of manufacturing processes, and novel battery monitoring and state estimation techniques. His work on the development of minimal-invasive cloud-based energy and condition monitoring platform (Point Energy Technology) has been successfully trialed in food processing and polymer processing industries, winning InstMC ICI prize 2015 and Northern Ireland INVENT 2016 award, and was included in the finalist of the Sustainable Energy Awards 2016 from Sustainable Energy Authority of Ireland. Dr Li has published over 180 international journal papers and edited 17 international conference proceedings in his area, winning over 10 national and international prizes and awards, including the most recent Springer Nature 'China New Development Award' in 2019 in recognition of the 'exceptional contributions to the delivery of the UN Sustainable Development Goals'.

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