

- **Title: Improving the life-cycle of Lithium-ion battery packs to support wind renewable fluctuations**

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Predicting and enhancing the life-cycle of Lithium-ion battery packs has been the subject of studies toward the large-scale use of storage systems to store the electrical energy in the time of fluctutation and unpredictable behaviour of wind renewable . Battery pack is a group of cells are placed in a parallel, series or matrix form to provide the required power. Life cycle prediction of a single cell is challenging due to the complexity of electrochemical reactions, thermal vraiablity and the formation of SEI layers. Cell interconnections make the prediction more challenging as the electrical dynamics and thermal characteristics of each cell is different from the others. This introduces random variability where the aging of a single cell propagates and reduce the life of the whole pack. This works investigates the use of accurate electro-chemical modelling and wireless sensor/antenna system in real-time estimation of the critical cell parameters, i.e. state-of-the-charge (SOH), state-of-health (SoH), internal resistance, and temprature variation. The integrated system will significantly supress the aging propagation and enhance the life-time of the pack.

Biography

Dr Kamyar Mehran is a Lecturer in Power Engineering in Queen Mary University of London, UK. He worked in University of Warwick as a research fellow (2013-2015), Newcastle University and Imperial College London (2010-2013) as a research associate and commercialization Manager for a spin-off company, OptoNeuro Ltd. He received his PhD degree in Newcastle University, UK in 2009. Prior to his academic career, he collected over 8 years of industrial experience in companies like Sun Microsystems (Oracle), and National Iranian Oil Company. His current research interests include nonlinear dynamics, intelligent control/optimization of energy storage systems, high-switching power electronic converters, and home energy management systems.

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