



2022 IEEE Electrical Power and Energy Conference (EPEC 2022)

Special Session on

Approaches for Robust Battery Management Systems

organized by

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Call for papers:

Rechargeable Li-ion batteries are becoming ubiquitous in wide ranging applications such as electric vehicles, renewable energy storage, consumer electronics, power equipment, and aerospace systems. Battery packs need to be constantly monitored and managed in order to maintain the safety, efficiency and reliability of the of the battery pack. Battery management systems (BMS) are vital to ensure safe, efficient and reliable battery pack. However, present day BMS suffer from many shortcomings: they lack of theoretically sound approaches; their performance measures vary with temperature; they rely on offline characterizations; they need to be specifically designed for particular battery chemistry, size, and voltage; and, their performance with aging is not well understood. In this special session, we invite original research that seeks to improve the state of the art in BMS.

Topics of interest include but not limited to:

- Equivalent circuit model (ECM) approaches to battery management systems
- Systems theory and machine learning (ML) approaches for battery modelling
- Approaches to battery state of charge (SOH) and state of health (SOH) modelling
- Battery system identification approaches for ECM, SOC, and SOH estimation
- Battery thermal management systems
- Novel battery charging solutions
- Cell balancing strategies
- Challenges faced in battery reuse applications
- Challenges in Li-ion battery recycling
- Cloud-based approaches for battery management

- Performance analysis of battery management system algorithms

SS Organizer Information

- **Dr. Balakumar Balasingam** is an Assistant Professor in the Department of Electrical and Computer Engineering at the University of Windsor. From 2012 to 2017, he was an Assistant Research Professor in the Department of Electrical and Computer Engineering at the University of Connecticut. He received his Ph.D. in Electrical Engineering from McMaster University, Canada in 2008. After his PhD, he held a postdoctoral position at the University of Ottawa from 2008 to 2010, and then a University Postdoctoral position at the University of Connecticut from 2010 to 2012. His research interests are in signal processing, machine learning, and distributed information fusion and their applications in autonomous systems; particularly, his close interests are in battery management systems, human-machine systems, and surveillance & tracking systems.