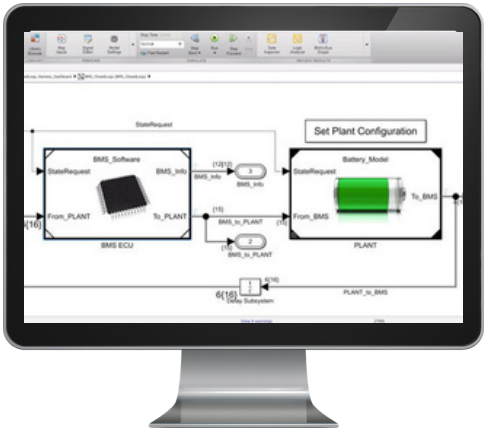
Live Seminar

BATTERY SYSTEM DESIGN WITH MATLAB

Seminar designed for battery engineers and scientists



When
09 Oct 2020
09:00am-10:30am SGT

Venue
Online via Webex

Organised By
IEEE IA/PEL Chapter SG
MathWorks
TechSource Systems

Overview

Modern **lithium-ion battery systems** have safety, performance, and durability requirements that demand careful battery management to ensure operation within **voltage**, **current**, and **temperature** limits. The effective management relies on an **accurate characterization** of the unit **battery cell**. Specifically, we need to know its charge and discharge curve profiles, internal resistances, time constants, degradation rate, and their temperature and aging dependencies.

This seminar will show how to design and use **characterization experiments** to construct an **accurate equivalent circuit** for a specific **battery cell**, with parameters depending on environmental and operating conditions, as well as age.

In addition, we will describe advanced state estimation techniques such as Kalman Filtering to determine state of charge using the characterization parameters obtained before. Finally, we will share some ideas on how to perform state of health estimation.

Presenter
Dr. Javier Gazzarri
Application Engineer
MathWorks

Presenter
Dr. Ravinder Pal Singh
Chapter Chair
IEEE IA/PEL Chapter SG

Organizers: IEEE MathWorks TECHSOURCE

Agenda

1. Battery cell modeling

- Equivalent circuit determination based on cell characteristics
- Model correlation using curve fitting and parameter estimation
- Characterization experiment design

2. State of Charge estimation

- Traditional methods and their drawbacks
- Kalman Filter methods

3. State of Health estimation

Speakers

Dr. Javier Gazzarri

Javier Gazzarri is a Principal Application Engineer at MathWorks in Novi, Michigan, specializing in modeling and simulation of battery systems as part of Model Based Design. His work focuses on physical modeling, from cell-level to system-level, parameter estimation for model correlation, battery management system design, thermal management, aging diagnosis, and state-of-charge estimation algorithm development. Before joining MathWorks, Javier worked on fuel cell modeling at the National Research Council of Canada in Vancouver, British Columbia. He received a Mechanical Engineering Bachelor's degree from the University of Buenos Aires (Argentina), a MASc degree (Inverse Problems for sensor design), and a PhD degree (Solid Oxide Fuel Cell degradation diagnosis) both from the University of British Columbia (Canada).

Dr Ravinder Pal Singh

Ravinder Pal Singh (S'04, M'10, SM'16) received the Ph.D. degree in 2010 from the National University of Singapore. He is currently working at Institute of Microelectronics (IME), A*STAR, where he has been focussing on Power Management ICs. His current areas of research are Integrated Voltage Regulators using Thin-Film Magnetics and next Generation SiC devices.
He is actively involved in various IEEE organizational units both at Section and Chapter level, charting the direction to expand members' benefits and catering to their needs. He is currently Chapter chair of IEEE Industrial Applications/ Power Electronics (IA/PEL)joint chapter and Membership Development chair for Singapore Section. He is also organizing chair for 14th IEEE International Conference on Power Electronics and Drive Systems (PEDS 2021).

Register at https://event.techsource-asia.com/webinar-battery-system-design-with-matlab

Organizers: IEEE MathWorks® TECHSOURCE