Smart Battery Management System

Battery Monitoring System
- Develop algorithms for real-time estimation of State of Charge (SOC) and State of Health (SOH) of the battery in different applications:
- Develop an accurate model for online evaluation of different battery chemistries with considering environmental and operating conditions.
- Develop adaptive algorithm to estimate the SOC and capacity of the battery based on the model.
- Estimation of the Remaining Useful Life (RUL) and End of Life (EOL)

Battery Modeling and Co-estimation Algorithm

Battery Model:
Lithium Battery Pseudo 2D Electrochemical model (discharge process)

Resistor- Capacitor (RC) equivalent model

LTI system:

Battery Parameters/SOC/Capacity Co-estimation

Battery SOH-RUL-EOL Estimation

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Electric Vehicle Testbed
- Battery state of charge (SOC) estimation on ARM-based microcontroller
- Simulate actual electric vehicle usage
- Graphical user interface (GUI) in LabVIEW and LCD
- Electric vehicle cruise control with programmable road profile