



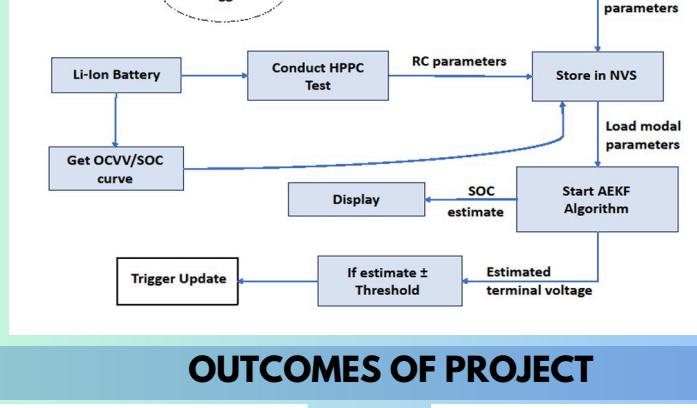
ADVANCED SOC ESTIMATION FOR LITHIUM-ION BATTERIES USING DATA DRIVEN MODELLING WITH AEKF

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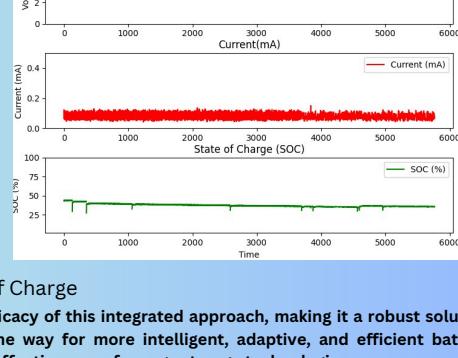
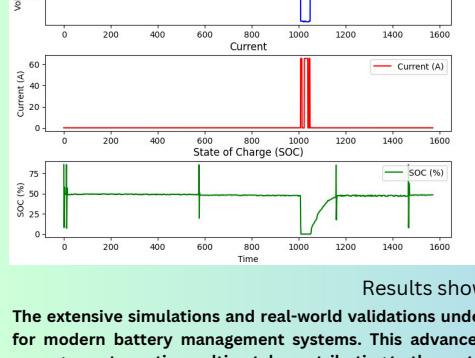
This project introduces an advanced approach that combines data-driven modeling with Adaptive Extended Kalman Filters (AEKF) to address challenges like maintaining accuracy due to the dynamic nature of battery characteristics, influenced by aging, temperature variations, and varying operational conditions in EV batteries. The proposed method leverages data-driven modeling to enhance the adaptability and precision of SOC estimation. By incorporating data-driven insights, the model dynamically adjusts to the evolving behaviors of lithium-ion batteries, accounting for factors such as capacity fade, temperature effects, and load variations. Extensive simulations and real-world validations demonstrate the efficacy of this integrated approach. Results indicate that this method significantly improves SOC estimation accuracy and enhances the overall reliability and lifespan of battery systems. The real-time applicability of this technique highlights its potential for practical implementation in modern battery management systems, paving the way for more intelligent and adaptive battery management practices.

Keywords— Adaptive Kalman filter, SOC Estimation, Adaptive Battery management systems.

PROPOSED METHODOLOGY



OUTCOMES OF PROJECT



Results showing State of Charge

The extensive simulations and real-world validations underscore the efficacy of this integrated approach, making it a robust solution for modern battery management systems. This advancement paves the way for more intelligent, adaptive, and efficient battery management practices, ultimately contributing to the sustainability and effectiveness of energy storage technologies.

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