Paper ID 174 : In-Situ Determination of Battery State of Health Considering the Remaining Capacity in Electric Vehicles – A Case Study

Abstract:

The battery pack's capacity is a crucial factor in determining the range of an electric vehicle (EV) and significantly influences purchase decisions. Over time, battery degradation reduces this capacity, making it essential for consumers, insurance companies, and leasing providers to assess the remaining battery State of Health (SOH). This is particularly relevant for used EVs, where battery condition directly affects resale value and usability. Given the non-linear aging behavior of battery packs, influenced by environmental conditions and usage patterns, accurately determining the SOH remains a challenge. This study compares various in-situ methods for estimating SOH_C using a Peugeot iOn, analyzing real-world driving and charging data over three years, and about 2850 kilometers. The findings aim to bridge the gap between laboratory-based assessments and practical, in-situ estimations of SOH_C, facilitating better decision-making for stakeholders.

Short CV – Tobias Felix Scholz

Tobias Scholz is a research associate at the Electric Vehicle Institute at Bochum University of Applied Sciences. Since 2017, he has been involved in the acquisition, management, and execution of research and industry projects. His main areas of expertise include modeling and diagnostics of lithium-ion batteries, energy management in charging infrastructures, and practice-oriented training and education for working with sustainable propulsion systems and mobility solutions. He is currently a doctoral candidate in Engineering Sciences at the University of Wuppertal. He received his master's degree in electrical engineering from Bochum University of Applied Sciences in March 2018.