Friday 27 September
3pm
F050, Hydrogen Energy Platform, Bât F, UTBM

Weihan LI

Head of research group AI for Batteries, CARL, RWTH Aachen

Dr. Weihan Li is the head of the research group "Artificial Intelligence for Batteries" at the Center for Ageing, Reliability, and Lifetime Prediction of Electrochemical and Power Electronic Systems (CARL) at RWTH Aachen University. He earned his Ph.D. with honors in Electrical Engineering and Information Technology from RWTH Aachen in 2021, following a Master's degree in Automotive Engineering and Transport from RWTH Aachen in 2017 and a Bachelor's degree in Automotive Engineering from Tongji University in 2014. Dr. Li conducted research at Imperial College London, the University of Oxford, and the Massachusetts Institute of Technology. He is the recipient of various awards, including the BMBF BattFutur Starting Grant, German Study Award from the Körber Foundation, the Reichart Prize from the Academy of Non-Profit Sciences in Erfurt, the vgbe Innovation Prize, the Battery Young Research Award, and the RWTH Innovation Award, etc.& Luxembourg

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Battery Digital Twin with Physics, Data and Artificial Intelligence

By collecting battery data from the field and building up the battery digital twin in the cloud, the degradation and safety of batteries can be monitored online and the information regarding the degradation modes can be extracted from the data. Physics-based models are gaining more and more success in describing cell behavior and early-stage capacity fade, while the emergence of machine learning models further generates rapid predictions of future health based on indicators learned purely from data. Blending the physics-based model and machine learning is challenging. Fundamentally, degradation of LIBs results from the inner multi-physical processes described by physical laws of thermodynamics and kinetics. However, real LIBs are complex, comprising multiple interfaces, materials, and broad usage conditions. The successful modeling of battery degradation and safety must inherently be capable of bridging spatial, temporal, and chemical complexity. Here, we will present our work in last years to show the methodology and benefits of integrating physics-based models and machine learning based data-driven methods for battery management.

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