

Lithium-Ion Battery Lifetime Prediction

Advanced analysis of battery testing data and features for machine learning



Master's Thesis or Bachelor's Thesis

Batteries and electrochemical energy storage devices are essential for the transition to a sustainable future. Long lifetimes of batteries result in long feedback times of performance and degradation. Testing can take several months to years [1]. Accelerating battery testing can help manufacturers and developers to validate new processes in turn leading to better and cheaper batteries.

In this thesis feature-based machine learning methods for battery lifetime prediction and the performance of different features shall be investigated.

Depending on your background the focus of this work can be more on the analytical, electrochemical or machine learning side.

Requirements:

- High motivation and interest in batteries and machine learning
- Methodological, goal-oriented, and independent working behaviour
- Experience with python and data analytics
- Linear Algebra and machine learning experience

Note: The written report and final presentation should be in English. The programming for this project should be done in Python.

Literature:

1. Severson, K.A., Attia, P.A., et al. Data-driven prediction of battery cycle life before capacity degradation. Nature Energy 2019, 4, 383-391. DOI: 10.1038/s41560-019-0356-8



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