



Wir bringen Forschung  
auf Top-Niveau voran –  
und uns selbst.

Veränderung startet mit uns.

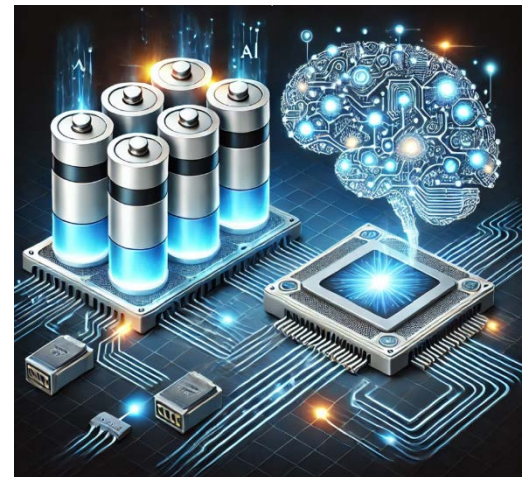
### Master thesis „Artificial Intelligence in Energy Management: Innovative Analytical Methods for Second-Life Battery Storage“

The increasing prevalence of small electric vehicles (e-bikes, e-scooters, etc.) is leading to a growing need for sustainable solutions for repurposing the many discarded batteries. As part of this master's thesis, the technical implementation of these batteries, which have reduced range, as stationary energy storage (Second Life) will be investigated. A newly developed energy management system aims to optimize the charging management of Second-Life e-bike batteries and enable accurate predictions of battery aging (State of Health, SOH). In this process, the state of charge (SOC) and the health status of the batteries play key roles. Using artificial intelligence (AI), the system will be designed to be self-learning and adaptive, continuously improving by learning from new data and experiences and optimally adjusting to the specific conditions of the batteries. The goal is to create a system that becomes increasingly efficient over time and enables the sustainable use of these batteries.

For our "Power Converter Units" group, we are currently seeking a student assistant with the opportunity to write a thesis.

#### What you do with us

- You develop a self-learning energy management system to optimize the charging management and aging prediction of second-life e-bike batteries.
- You conduct simulations for monitoring the state of charge (SOC) and predicting the state of health (SOH) under various scenarios.
- Your tasks include analyzing and comparing different AI-based analytical methods to optimize battery performance.
- You document the results and create presentations to showcase the system performance and the improvement process.
- You will work with the Plect software.



#### What you bring with you

- You are studying information technology, electrical engineering, or a comparable field.
- You have a basic understanding of the functioning of power electronics.
- You possess basic knowledge in electrical and energy engineering.
- You plan and complete tasks independently and with high quality.

**Start:** asap  
**Duration:** 6 Monate  
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