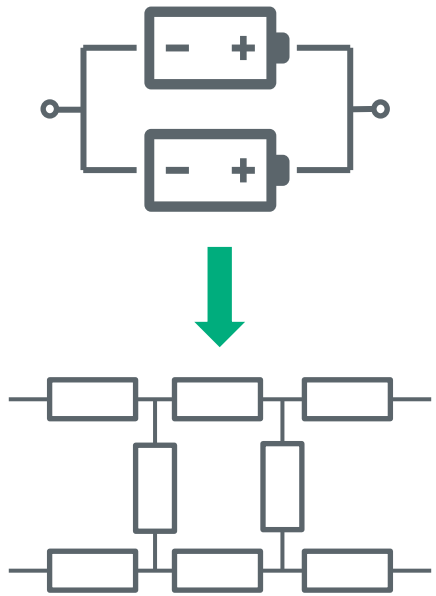
Proposal for a Research / Thesis Topic

Development of a Distributed Equivalent Circuit Model for Parallel-Connected Battery Cells

In battery systems, multiple cells are often connected in parallel to increase the available capacity and current capability. This student project focuses on developing a Distributed Equivalent Circuit Model for parallel-connected battery cells to simulate their overall behavior. The model represents the electrochemical behavior of battery electrodes using a network of resistive and capacitive elements.

The work includes the mathematical formulation, implementation, and validation of the model. Additionally, different simulation scenarios can be investigated, such as varying current profiles and cell-to-cell inhomogeneities.



Prerequisites

- Basic knowledge of lithium-ion batteries
- Interests in battery modelling and scientific literature research
- Basic knowledge in MATLAB/Python programming

Additional beneficial skills

- Knowledge in laboratory work

Contact

Malte Wegers, M.Sc.

✉ malte.wegers@uni-bayreuth.de

Chair of Electrical Energy Systems

Prof. Dr.-Ing. Michael Danzer

Universitätsstraße 30, 95447 Bayreuth

✉ ees@uni-bayreuth.de