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INSTITUT FÜR
MECHANIK UND
MECHATRONIK
Mechanics & Mechatronics



MASTER THESIS

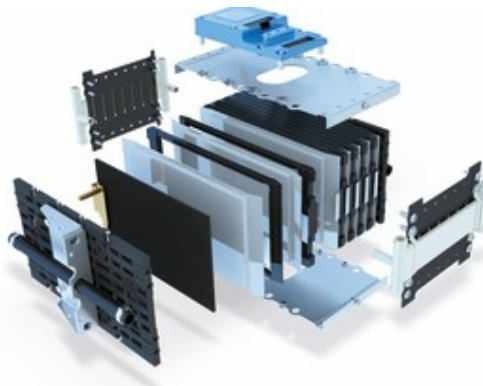
Optimal charging strategies for Lithium-ion cells



Content of the proposed master thesis:

One of the challenges involved in achieving an efficient and intelligent electric vehicle operation is to minimize vehicle downtime due to battery charging. Fast charging strategies play a crucial role in minimizing this downtime, while at the same time maintaining the operational constraints, which ensures a safe operation while keeping battery degradation in check.

This Master Thesis will investigate optimal charging strategies for Li-ion batteries, both from a time and degradation point of view. The student is expected to perform a thorough literature review and then implement a minimum-time charging optimization strategy in MATLAB, based on previously developed models and compare them to state of the art charging cycles.





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General tasks:

- Familiarize yourself with relevant literature regarding lithium-ion cell charging strategies and basics of optimal control
- Implement the charging optimization in MATLAB
- Compare the results with state-of-the-art charging strategies

Requirements:

- Basic programming (MATLAB) skills
- Previous knowledge on optimal control is a plus
- High motivation

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