Shell Technology Center Hamburg

Modelling and Simulating an Electric Vehicle Battery System during high-power DC Charging Scenarios

Master Thesis in the field of energy and vehicle engineering

Who we are

As part of Shell's global technology development network, our scientists and employees are actively working to reduce society's carbon footprint, reduce emissions from our energy products and find competitive solutions for our customers.

Our Shell Technology Centre Hamburg (STCHa) cooperates with Shell centres in the Netherlands, USA, China, India, UK and Japan. As part of this community of more than 3000 scientists, researchers and engineers, we focus on further differentiating products for mobility and industrial customer requirements. The Energy Application Testing department at the STCHa conducts R&D testing on high-power e-vehicle charger systems and evaluation of electric/electrified powertrains using a road test vehicle fleet.

What you will do

The goal of the project is to help develop a detailed physics-based vehicle model of a battery electric vehicle using the GT-Suite and GT-AutoLion simulation software, to characterize the battery performance during high-power DC charging. Experimental data will be extracted from battery electric test vehicles equipped with CAN data loggers as well as performance diagnostics from the DC charging station. Once validated, the utility of the BEV model should be assessed by simulating a range of charging scenarios, i.e. charge profiles over a range of battery states and environmental conditions representative of real world driving/charging scenarios. Finally, a case study is to be conducted to predict the comparative performance of an immersion cooled battery pack designed with the same form factor as a direct replacement for the original vehicle battery.

What you bring to the table

- You are studying towards a postgraduate technical degree
- Independence and willingness to learn new topics
- Interest in interdisciplinary issues in the field of battery electric and vehicle system modelling
- Some experience and interest in modelling and programming, ideally in GT-Suite, Python/Matlab.

What you can expect

- As part of a dynamic experimental team, you will be actively developing advanced analysis and model simulation tools.
- Clearly defined goals and responsibilities, as well as mentorship from senior staff members.
- We offer a creative and flexible working schedule.
- Ideal environment to gain practical experience.

Contact

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