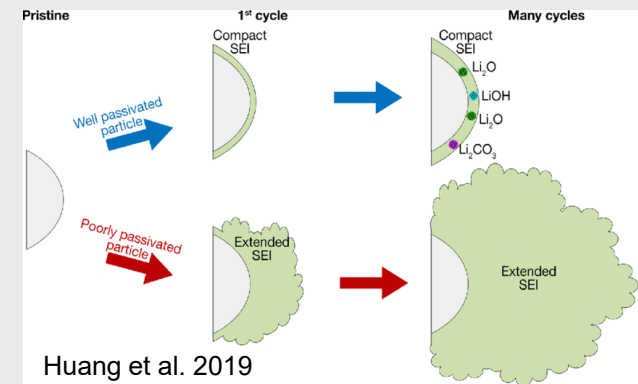## Uncertainty quantification for solid-electrolyte-interphase growth in lithium-ion batteries

Lithium-ion battery degradation is a complex and extensive topic that has been the subject of many studies. Among all the mechanisms responsible for battery degradation, the growth of solid-electrolyte-interphase (SEI) plays an important role, and the uncertainties during SEI growth also make the degradation unpredictable. Therefore, understanding the formation and growth mechanism of the SEI and quantifying the uncertainties is crucial for developing strategies to extend battery lifespan and improve battery performance.

Huang et al. 2019

This work aims in the first step to build the basic mathematical physical model to simulate the growth of SEI. The SEI-growth model will be coupled with the existing battery model and sensitivity analysis will be carried out to identify the important parameters that cause the uncertainty. Further evaluation and analysis will be conducted based on the results of the sensitivity analysis.

Requirements
- Good programming skills (Python advantageous)
- Understanding of battery and electrochemistry is desirable

Interested in:
- Modeling and simulation
- Uncertainty quantification
- Energy storage technology

Contact:

Yibo Wen

Tel.: 0531 / 391 - 7860

yibo.wen@tu-braunschweig.de

Offer: Master thesis / Studienarbeit   Start date: as soon as possible