

Hybrid data-science / multi-physics modeling approach to assess and predict battery durability

Nowadays, in particular in the context of Electric Vehicle (EV) applications, there is high interest in developing highly accurate lithium ion battery aging models allowing earlier failure prediction, greater interpretability, and broader application to a wide range of cycling conditions. Multiphysics models describing with some detail aging mechanisms can provide understanding of experimental observations but under the restrictions of the assumed mechanisms and at expenses of high computational cost. In the other hand, well-trained machine learning techniques can potentially combine high accuracy and low computational cost, making it highly interesting for aging models and accurate predictions of battery lifetime.

We are seeking for a candidate to carry out a PhD project between Renault and LRCS to start at the beginning of 2022. Such project aims at developing and validating a hybrid methodology encompassing both, machine learning methods and multi-physics modeling. The project concerns in particular :

- the analysis of large battery aging datasets using advanced statistics and machine learning techniques to unravel parameters interdependencies ;
- on the basis of those interdependencies, the development and validation of multi-physics models with different degrees of complexity to predict battery lifetime among other features of relevance for EV applications.

We are looking for an individual having a MSc. or engineer diploma with background in data science, applied mathematics and physics or physical chemistry.

If you think that you are the right person to undertake this challenge, please send your CV and short motivation letter before November 1st, 2021 to :

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