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Topic

“**Deep Learning** approach to evaluate the degradation of batteries based on synthetic data”

Description

Due to fluctuating availability of renewable energies, the importance of **energy storage systems** (ESS) increases. Based on their high energy efficiency, batteries are one of the trending technologies to store electrical energy. However, the production of batteries is afflicted with large ecological side effects. Volfang is a start-up which addresses this problem by building ESSs based on 2nd-life batteries of electrical vehicles. Thereby the lifespan of those batteries can be improved significantly.

The analysis of **battery degradation** is a complex task, yet it is crucial for 2nd-life batteries to ensure good quality and safety in their refurbished application. By today there is some big data publicly available which is suitable for battery diagnosis and prognosis. The data has been artificially generated on the basis of a **mechanistic battery model**. The model has been showing good success in the forecasting of battery degradation processes and is capable of generating path dependent battery behaviour for different aging processes. Thereby a large amount of data could be generated suitable for big data analysis.

In this thesis a **deep learning approach** is to be developed which is trained on a **synthetic dataset** with the goal to predict a battery's degradation behaviour. The thesis will be under the guidance of one of the **inventors developers** of the mechanistic battery model who is one of the leading battery researchers in the field.

You should bring...

- A technological field of study
- Programming experience with e.g. python, MATLAB.
- Experience with machine learning methods and common libraries like Tensorflow or Pytorch
- You enjoy working through vast amounts of data, clearing them up and finding correlations.
- Good english knowledge
- Right motivation and focus

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