

# Want to enable a future worth living with your Master Thesis?

## Topic

“**Synthetic data generation** of battery degradation scenarios based on a mechanistic framework”

## 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 trending technology 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. An extensive testing of battery modules often takes multiple days, which makes it economically difficult to compete against ESSs, built with new batteries. Thus, a quick and reliable testing method is required for 2nd-life batteries to be competitive with new batteries not only ecologically but also economically. (However, **rapid testing** requires precise knowledge of the battery to be tested, as the information gathered in a rapid test is limited. Hence, our goal is to conduct a study of favourable features that can be tested in a short amount of time with a maximum output of information about the battery’s level of degradation.)

One core component in the battery diagnosis and prognosis is forming a **digital twin** of the batteries, via a solid cell model. The goal is to implement a battery model following a **mechanistic approach**. 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.
- You enjoy working through vast amounts of data, clearing them up and finding correlations.
- Good english knowledge
- Right motivation and focus

## We provide...



Lots of responsibility in a fast growing and sustainable Start Up



Modern office, including everything to your heart desires



Paid Master Thesis



URBAN SPORTS CLUB

Cooperate Benefits at Urban Sports Club (Wellness und Sports facilities)



Guidance of one of the leading battery researchers from HNEI

We look forward to getting to know you,

*Deine Volfang.*



## Contact

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