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Master thesis / Bachelor thesis / Project work

Application of machine learning methods to optimize tomorrow's battery production.

Picture source: informatec

Initial situation:
The battery production in Europe has to go through a much steeper learning curve compared to the competitors from Asia in order to keep up with the price competition. Especially in battery cell production, there is a lack of knowledge about the relation between the production processes and the influence on quality and performance. The use of machine learning (ML) as a subfield of AI could be a solution to this, as it can be used for new problem solutions or for the analysis of previously unknown data. In contrast to previous model-based approaches, ML algorithms recognise complex relationships of reality in data and apply them to new problems using various functions. The knowledge and the data can be used for the optimization of tomorrow's battery gigafactories in Europe. But in order to utilise the potential of these ML models (especially from the field of supervised learning) in future productions, certain challenges must be overcome.

Your task:
Within the scope of your thesis, the overarching task is to apply an approach for data-based optimization within battery production. For this purpose, a data-based optimization approach from the field of ML is to be selected based on systematic research and evaluation with regard to the use of machine learning approaches in the field of battery production. This ML model will then be designed, programmed (ideally using Python) and validated using a data set from experiments in the PEM's own pilot plant.

Requirements:
- Degree in engineering, computer science (or comparable)
- Structured way of working
- Good knowledge of PowerPoint, Word and Excel

Offered:
Fast processing
- Delimited tasks and flexible processing
- Professional supervision and insight into industry and practice
- Independent implementation with consultation via Microsoft Teams

Interested?
Please send a current transcript of grades as well as your CV and references to the e-mail address below.

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