

Bachelorarbeit / Masterarbeit

Implementation of Artificial Intelligence Methods for Parameter Identification of Redox Flow Battery Models

Topic

Battery System Modelling

Focus

- ✓ Theory
- ✓ Literature
- ✓ Simulation
- ✓ Programming
- Construction
- Hardware
- ✓ Experiments

Course of study

- ✓ Electrical engineering
- ✓ Mechanical engineering
- ✓ Mathematics
- ✓ Mechatronics
- ✓ Computer Science

Starting Date

As soon as possible

Please send your application to:

M.Sc. Felix Schofer
felix.schofer@kit.edu

Battery Technology Center,
Building 420, Room 256
Tel: 0721 608- 28809
www.batterietechnikum.kit.edu

Skills recommended

Experience with Matlab, Machine Learning and Batteries

Motivation

Equivalent circuits (EC) are often used to describe the behavior of battery systems using simple electronic components. The challenge therein lies in the identification of the correct values for the components of an EC for a precise representation of the battery system. One way to identify these parameters is the evaluation of system measurements using AI algorithms, e.g. Neural Networks or Genetic Algorithms. These methods promise good modelling results with relatively low effort, especially when compared to traditional approaches.



Tasks

To start off the thesis, existing methods of battery modeling using AI shall be researched. Using this research, the most suitable method for the flow batteries of the Battery Technology Center is chosen. The selected method is then implemented in Matlab and validated. This can either be done using existing data, or by conducting newly developed experiments. Finally, the new algorithms will be compared to existing models.

Required Documents

Curriculum Vitae and Transcript of Records