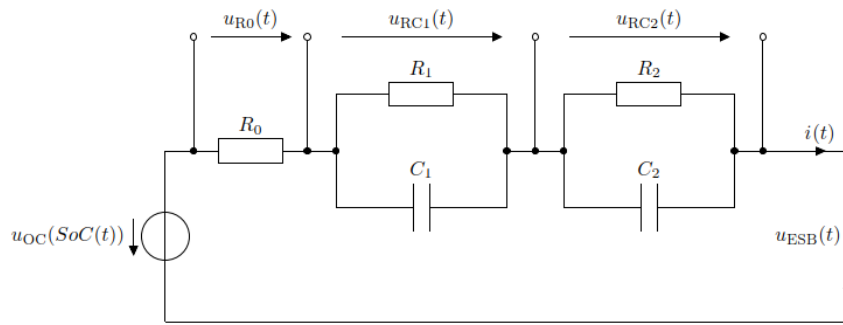


– Research Internship / Master's Thesis –

# Innovative Approach to Battery Model Parameter Fitting from Data



## Background

Battery modeling focuses on developing sophisticated computational models that simulate the electrochemical processes within a battery. It is crucial in understanding, estimating, and predicting the performance, efficiency, and lifespan of batteries.

Equivalent circuit models (ECM) provide a simple but computationally efficient approach to simulate the cell's electric behavior. However, the non-linearity inherent in the ECM makes it challenging to parametrize.

The goal of this thesis is to develop and validate a novel parametrization method. This approach aims to effectively characterize the open-circuit voltage (OCV), the internal resistance and RC-components of the ECM with the use of *ansatz* functions.

This project lies at the intersection of engineering, mathematics, and informatics. With focus on the development of algorithms and data analysis for battery technology.

## Tasks

1. Literature Review and Theoretical Understanding.
2. Data Collection and Preprocessing.
3. Algorithm Development and Implementation.
4. Model Validation and Analysis.

## Requirements

- Understanding of battery fundamentals.
- Good experience in programming and software development.
- Mathematical aptitude.
- Motivation and independent work

## Topics

- Cell characterization
- Measurements
- Hardware design
- Software design
- Modelling
- Simulation
- Literature research

## Study program

- Electrical engineering
- Informatics
- Mechanical engineering
- Physics
- Mathematics
- Chemical engineering
- Industrial engineering

## Contact

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