Institut für Grundlagen
und Theorie der Elektrotechnik

Bachelor/Seminar Thesis

Differentiable Electrical Network Solver

Motivation

Optimization is crucial in the development of devices. To facilitate the usage of efficient optimization strategies, the derivatives of the objective function need to be computed. Automatic Differentiation (AD) is a tool which can be employed at the model development stage to ensure that the model is inherently differentiable. Therefore, prerequisites are needed to easily interface to optimization routines.

Research Questions

The goal of this bachelor thesis is the development of a simple differentiable electrical network solver. Meaning that the solver itself gets implemented in python or julia to be differentiable by employing automatic differentiation libraries. The idea is to get a good understanding of the concepts behind AD, how a simple electrical network solver works and how to efficiently merge and implement these parts. Additionally this work also has potential to be extended to a seminar and/or master thesis.

Tasks

- Automatic Diff. (understanding concepts, experimenting on simple examples)
- Electrical network solver (theory, developing a system concept, implementation)
- Merging with Automatic Differentiation

Prerequisites

- Language : German/English
- Start : As soon as possible
- Programming skills : Intermediate
- Study : ET, ICE, ET-Toningenieur

Contact/Supervisor

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