Master's Thesis

In cooperation with Dassault Systèmes

Machine-Learned EMC Model of an EV Motor Drive

Current Status and Motivation: The automotive market experiences a boom in the development of electric vehicles (EVs). Equipment suppliers are challenged to design a variety of electric machine drives with various key performance indicators, like rated power, EMC requirements or simply cost. For companies, it is impossible to build and test all variants in hardware. Instead, computer simulation is used. Currently, each new variant requires the setup and evaluation of a new simulation model, which is time-consuming. In your thesis, you apply machine learning methods to speed up this procedure by at least a factor of 1000. Using adaptive learning, you train a behavioral model that predicts the EMC emissions for all parameter constellations immediately, opening up new ways for variant development and optimization.

Research Topic(s):

- Power electronics EMC, Electric Vehicles
- Machine Learning, Adaptive Learning

Approach / Methodology:

- Predict the conducted emissions of the powertrain of an electric vehicle using an EMC simulation model provided by the company Dassault Systèmes (CST Studio)
- Feed this model into a machine learning toolchain to generate a behavioral model that works over the entire parameter space. MATLAB or python is required.

Organisational Matters:

- Start of work: as soon as you like
- Workplace: IFE/TU Graz

Contact person / Supervisor:

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