

Prof. Dr. Malte Jaensch

Electric Machines, Power Electronics, Control, Software

Master Thesis

Development of Control Software for Automotive and Stationary Asynchronous Electric Machines

Description

The institute uses open-source inverter hardware for various research and test bench applications. While the existing platform provides the fundamental hardware and software infrastructure, it currently lacks a control implementation for asynchronous machines, which are both relevant in automotive traction systems and are widely used in industrial and test bench applications. The aim of this thesis is to develop and validate a flexible control software framework for asynchronous machines. Starting from an existing 48 V inverter and test bench setup, suitable control strategies shall be investigated and implemented. In addition to the machine control itself, the software shall provide the required application framework, including interfaces for communication and parameterization, e.g., via CAN. The resulting software shall be applicable to different asynchronous machines and inverter hardware variants, ranging from low-voltage 48 V systems to high-power applications with DC-link voltages of up to 800 V. The developed control approach will finally be experimentally validated on suitable test bench setups.

Tentative Tasks

- Independent literature research regarding inverter hard- and software (focus on asynchronous control)
- Development and implementation of a suitable software architecture and machine-control strategy based on an existing 48 V test bench
- Implementation of communication, parameterization, and diagnostic functionalities
- Extension of the control software to support different machines and inverter hardware configurations
- Development and execution of suitable test and validation procedures
- Evaluation and documentation of the developed control approach

Requirements

- (ideally advanced) knowledge about modern electric machine control systems
- Solid foundation in MATLAB/Simulink, and/or C
- Basic knowledge about the automotive electric drivetrain
- Fluent English

Start

Any time from now

Contact

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We are looking forward to your application, including a CV and Transcript of Records