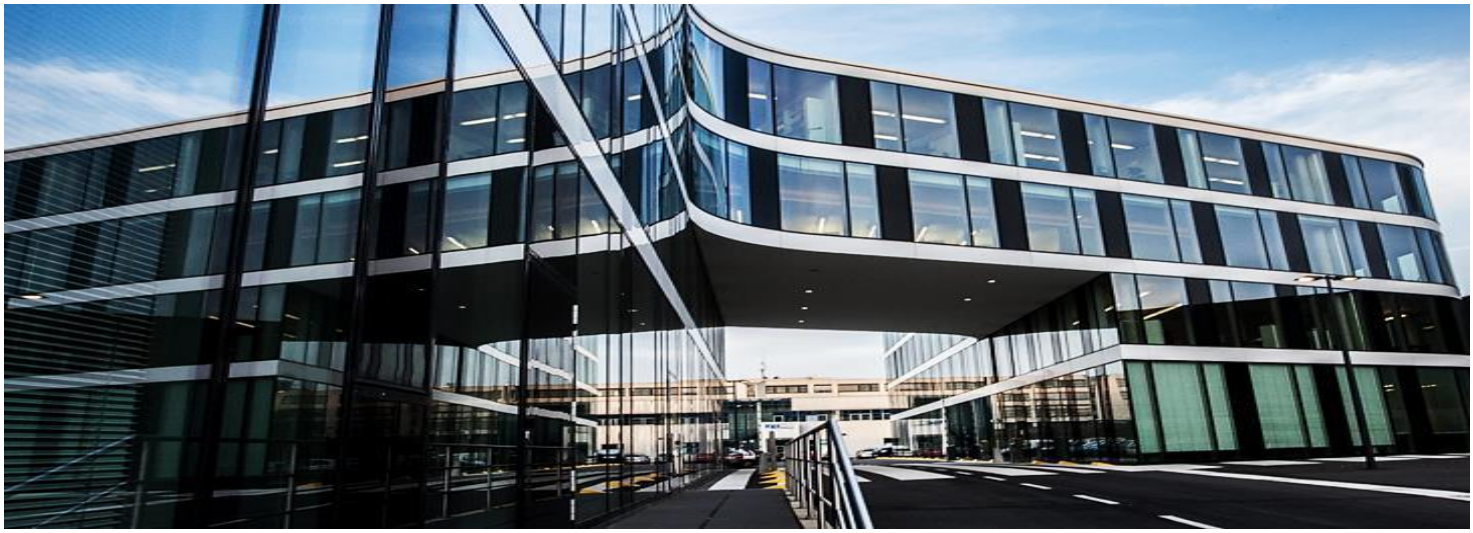

Lehr- und Forschungsgebiet Mechatronik in mobilen Antrieben | RWTH AACHEN UNIVERSITY

cmp Center for Mobile Propulsion | RWTH AACHEN UNIVERSITY

The Teaching and Research Area for Mechatronics in Mobile Propulsion is located between the domains of mechanical and electrical drive components as well as control algorithms. Under the guidance of Professor Jakob Andert, the institute researches innovative, environmentally friendly vehicle drives and particularly emphasizes electrification and simulation-based development methods.

The automotive sector is currently undergoing a major transformation that is in particular affecting the drive technology. Electrification is gaining enormous relevance as one of the key technologies to reduce or avoid emissions. Regardless of the specific technology, a steadily increasing complexity of both the hardware and the associated control algorithms is leading to the evolution of modern drives towards software-intensive, embedded mechatronic systems.

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Bachelor Thesis / Master Thesis

Start: from now

☒ Faculty 1 - Mathematics, Computer Science and Natural Sciences
☒ Faculty 4 - Mechanical Engineering
☒ Faculty 6 - Electrical Engineering and Information Technology

Start-up Procedure and Anti-Disturbance Improvement for PMSM with Sensorless Control

Sensorless control for PMSM is a widely studied technology by utilizing the rotor-flux estimation method based on fundamental components of voltage and currents. It mainly relies on the back EMF calculation for accurate rotor position estimation. However, at zero and low speed, the back EMF voltage is not high enough for rotor position estimation. The inaccurate rotor position estimation will cause the failed start-up procedure and the rotor position would be out of observation when disturbance is applied to the motor at low speed. The target of this research topic is to improve the sensorless control for PMSM in wide speed range application and improve the control robustness at low speed. The control algorithm will be modelled in MATLAB/Simulink, implemented and verified in STM32 microcontroller.

Your tasks / your profile:

- You are studying mechanical engineering, electrical engineering or a similar subject
- Good knowledge in electric machine or control theory
- Experience with MATLAB/Simulink, C/C++ programming

Would you like to know more?

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