

Dissertation press release**15.10.2019**

Towards efficient electrical motor control: Synchronous motor drives

Title of the dissertation	Control Methods for Permanent-Magnet Synchronous Reluctance Motor Drives
Contents of the dissertation	<p>In the future, energy-efficient synchronous reluctance motors, with or without permanent magnets, could replace induction motors in many applications, such as pumps, fans, and conveyors. Furthermore, interior permanent-magnet synchronous machines and permanent-magnet synchronous reluctance motors are increasingly used in electric vehicles and heavy-duty mobile working machines. These motors have good flux-weakening capability and the high torque density. The high torque density of these motors comes at a price of highly nonlinear magnetic saturation characteristics. A high-performance controller is needed to optimally control these motors.</p> <p>This thesis presents the control methods for these magnetically salient synchronous motors. The proposed control methods can be automatically tuned with minor effort from the user. Apart from industrial applications like fans, pumps, and conveyers, the designed control methods have applications in electric vehicles and heavy-duty mobile working machines. The developed control methods were tested using simulations and experiments.</p>
Field of the dissertation	Industrial Electronics and Electric Drives
Doctoral candidate	Hafiz Asad Ali Awan, M.Sc. (Tech) Electrical Engineering
Time of the defense	15.11.2019 at 12:00 noon
Place of the defense	Aalto University Computer Science building, hall T2, konemiehentie 2, 02150 Espoo
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Custos	Professor Marko Hinkkanen, Aalto University School of Electrical Engineering, Department of Electrical Engineering and Automation
Electronic dissertation	http://urn.fi/URN:ISBN <i>(permanent link to dissertation, if dissertation is already available in electronic form)</i>
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