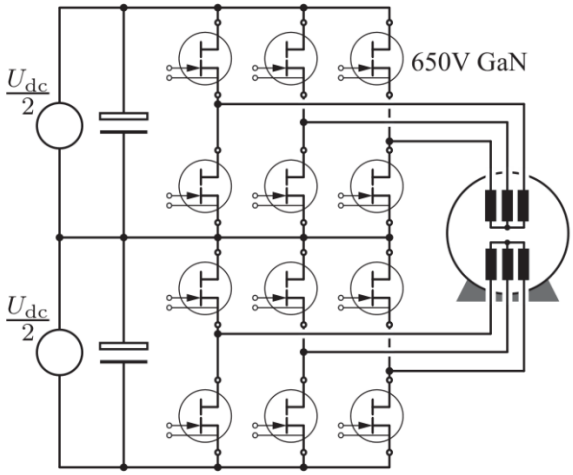
universität innsbruck

innsbruck Drive and Energy Systems Laboratory

Bachelor Thesis

Advancements in Control Strategies for Six-Phase Synchronous Machines with Stacked Inverters



Background: As illustrated in the accompanying diagram, the inverter system showcased herein integrates dual three-phase inverters in a stacked arrangement. This configuration allows the utilization of 650V power semiconductors, paving the way for creating a fully GaN-driven system. This system enhances fault tolerance on the motor front and promises greater integration prospects by distributing power more evenly across the motor windings.

Objectives: Our goal is to meticulously simulate this sophisticated inverter system's control and evaluate its operational characteristics in detail.

Approach: Embark on an academic journey beginning with the basic principles of three-phase inverter control, progressing to the more complex stacked inverter system. This exploration will provide a comprehensive understanding of control strategies applicable to advanced drive systems.

Tools/Software: The project will leverage the capabilities of MATLAB and PLECS for a dynamic and insightful simulation experience.

Prerequisites: A foundation in power electronics and drive systems and a genuine enthusiasm for delving into advanced control techniques.

Application and Supervision:

Ass. Prof. DDr. Spasoje Miric
spasoje.miric@uibk.ac.at