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Masterthesis, Bachelorthesis, Seminar, Research Internship

Fault Tolerant Control in Modular Multilevel Converters (MMC)

Since its invention in 2002, the Modular Multilevel Converters (MMC) has attracted considerable interest from researchers and industry. Especially due to their benefits modularity, scalability, (intrinsic) redundancy, several number of voltage levels, and therefore simple adaptability, this topology is already adapted in electrical power systems such as HVDC systems and plays a crucial role in the current energy transistion. However, due to the high number of electrical components such as semiconductors and capacitors, this topology suffers from reliability. It is important to continuously monitor the system state and behaviour to maintain its operation. Fault tolerant control (FTC) strategies face this issue and enable post fault operation of systems to increase their reliability and availability. So far, few approaches are published in literature to enable such operation strategies and it is still in the focus of research to provide real-time capable algorithms to provide an adavanced FTC.

The project covers...

- Literature review on state of the art of FTCs in MMCs

- Defining fault scenarios which should be tackled

- Developing an algorithm for an FTC of MMCs

- Implementation of proposed and developed algorithms in Matlab & Simulink

- Simulative validation using Matlab & Simulink

- Experimental validation on the LMRES MMC test bench based on the powerful real-time system UltraZohm.

Your profile...

- Student in the field of electrical engineering / renewable energy systems / ...

- Highly interested in control theory (and power electronics)

Interested? For further information and/or application please contact Oliver Kalmbach, `oliver.kalmbach@hm.edu`

Oliver Kalmbach, M.Sc.

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