Master Thesis

Advanced model predictive control of multilevel converters for high power wind power systems

Published Date: May 01, 2024

Description

In recent years, multi-level converters have gained prominence as a preferred alternative, particularly for medium/high-voltage applications, owing to their merits such as lower dv/dt stress on switches and lower power losses. However, the increased voltage level brings some challenges like high cost for system design and multi target for control strategies. Model predictive control is a promising candidate to solve multi-target problems. Therefore, this topic is to design an advanced model predictive control strategies to enhance the system performance and reduce the computational burden.

Tasks

- Literature reading. Get familiar with the background and the control theory;
- Establish the model of the focused topologies, including 3L converters and 5L converters (or parallel 3L);
- Design the optimal control strategies of the system;
- Try to figure out some current challenges and verify via simulation or experiment.

Prerequisites

- Great interest and basic knowledge in power electronics, control arithmetic (mpc is better);
- Matlab/Simulink software;
- Good stills at writing and reporting;

Contact and further information

- For further information, please contact to Mr. Yongdu Wang by email: yongdu.wang@tum.de;
- Please attach your CV and the latest study transcript to the application.

M.Sc. Yongdu Wang

Technical University of Munich
Chair of High-Power Converter Systems
Arcisstr.21, 80333 Munich
yongdu.wang@tum.de
www.epe.ed.tum.de/hlu