

Einladung zu einem Promotionsvortrag

Vortragender: Oliver Pohl, M.Sc.

Thema: **Coordination of Impedance Controllers and Flexible Power for Curative Congestion Management in Real-Time Applications**

Inhalt: As the share of feed-in from renewable energy sources rises in German electricity grids, established preventive congestion management processes are called into question. Curative congestion management may increase the utilization of already existing grid capacity without the large investments necessary for conventional grid expansion. The curative paradigm shift requires fast reacting remedial measures, such as innovative power flow controlling devices, as well as reliable algorithms to determine and activate them in due time. This work shows how an automated system can coordinate distributed FACTS devices, that influence a power line's series reactance, and active power from flexible units to solve line overloads in high voltage grids. First, linear sensitivities for gradual reactance changes are derived. Based on this, an optimization and a heuristic approach for automated curative coordination of both types of remedial measures is conceptualized as well as implemented and tested in simulations. Then, the heuristic approach is implemented within a distributed agent-based control algorithm, along with fallback strategies to be executed if agent communication fails. This system is then tested in a laboratory setup to evaluate its real-time applicability. The laboratory setup consists of multiple (Power) Hardware-in-the-Loop modules to create an experimental environment considering many real-world factors that are usually neglected in software simulations. This way, not just the agent algorithm, but also the influence of communication delays, reaction times of real power flow controlling devices as well as the integration into a control center environment are evaluated.

Termin: 17.04.2024, 15:00 Uhr

Ort: Martin-Schmeißer-Weg 12, Raum 2.7, 44227 Dortmund

Zoom: <https://tu-dortmund.zoom.us/j/97990861933?pwd=WVppVE9VLzJ3eDlRaEFSY3JGMCM9hdz09>

Vortragsleitung: Prof. Dr.-Ing. Christian Rehtanz

bei Rückfragen wenden Sie sich an das
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