IEEE PES Subcommittee on Big Data & Analytics for Power Systems
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# IEEE BDA Tutorial Series: Big Data & Analytics for Power Systems

## Control and end-to-end stability analysis of converter dominated power systems

Dominic Groß
University of Wisconsin-Madison

9:00 am-11:00 am, Monday, June 27, 2022, Pacific Time
(6:00 pm - 8:00 pm, Monday, June 27, 2022, Central European Summer Time)

**Abstract:** At the heart of the transition to a zero-carbon power system is a technological paradigm shift from conventional bulk generation to distributed renewable generation connected to the grid via power electronics. The rapid and massive integration of heterogeneous converter-interfaced renewable generation results in significantly different power system dynamics and challenges standard operating paradigms, system models, and controls. This talk will focus on recent results on universal grid-forming controls are compatible with a wide range of emerging and legacy technologies and form the basis for scalable end-to-end analytical stability certificates for converter-dominated power systems. In this general setting challenges arise from a lack of precise models at the system-level (i.e., network topology) and device-level (i.e., dynamics induced by proprietary controls). The talk concludes with an outlook on opportunities for certifying dynamic stability of converter-dominated power systems using data.

**Bio:** Dominic Groß is an Assistant Professor with the Department of Electrical and Computer Engineering at the University of Wisconsin-Madison, Madison, WI, USA. He received his Ph.D. degree in Electrical Engineering from the University of Kassel, Germany, in 2014. Prior to joining UW-Madison, he was a postdoctoral researcher at the Automatic Control Laboratory of ETH Zürich. He received an NSF CAREER award in 2022. His research interests include distributed control and optimization of complex networked systems with applications in low-inertia systems and converter-dominated power systems.

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