SMART GRID CENTER
TEXAS A&M ENGINEERING EXPERIMENT STATION

SGC WEBINAR

Techniques for Designing Large Transmission Networks in Synthetic Electric Grids

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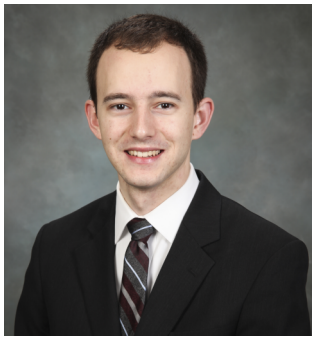
Abstract: The large grid of high-voltage transmission lines and transformers that forms part of a bulk electric power delivery system can be characterized by a number of metrics from graph theory, network science, computational geometry, and engineering analysis. Example metrics include the distribution of the number of links connected to each node, the length of the path between any pair of nodes, and the frequency of same-voltage crossings. As the system is built and expanded over many years, these metrics or system properties emerge from a complex balance of design objectives and planning constraints. Identifying such metrics can provide insight into system structure for the purposes of quantifying and improving system resilience, not only for ordinary operation but in preparedness for extreme events. In addition, new techniques apply these metrics to creating synthetic test cases and datasets that are as large and complex as actual grids, and share the metrics of system structure. This webinar will discuss recent efforts to develop synthetic electric grids, focusing on techniques for constructing realistic transmission networks by applying structural metrics derived from analysis of actual large-scale electric grids.

December 9, 2020 at 3:00 P.M. CST

Register in advance at

https://tamu.zoom.us/meeting/register/tJAtd-CtqD8qE9xHNoHq5JETL29hXWaW3-IS



Adam B. Birchfield is an Assistant Professor in the Department of Electrical and Computer Engineering, Texas A&M University. Prior to this he was a research engineer at the Electric Power Research Institute (EPRI). He received the B.E.E. degree from Auburn University in 2014, M.S. in electrical and computer engineering from the University of Illinois at Urbana-Champaign in 2016, and Ph.D. in electrical engineering from Texas A&M University in 2018. Dr. Birchfield's research is in power system modeling, large system transient dynamics, applications of synthetic power grid datasets, and the resilience of power systems to high-impact, low-frequency events.