



PSERC WEBINAR

Synthetic Datasets for Energy Infrastructure Modeling

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This presentation covers recent advances in building synthetic datasets for the bulk power system and related infrastructure. Synthetic datasets provide test cases for research and development, spurring innovation and supporting research reproducibility. Covered in this presentation is a characterization of the bulk electric power system's vast network of high-voltage transmission lines and transformers, using a number of metrics from graph theory, network science, computational geometry, and engineering analysis. This characterization underlies the synthesis methodology, which consists of a heuristic balance of graph generation, discrete optimization, and engineering planning emulation to produce high-quality, realistic, large-scale synthetic electric grid test cases. The presentation will also discuss how these methods and metrics are being applied to interdependent energy systems, such as electric distribution and natural gas pipelines, and how the complex network characterization of the grid can also shed insights into potential fragility and resilience to adverse events.

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[LINK TO WEBINAR](#)

1:00-2:00 P.M. ET

(10:00-11:00 A.M. PT)

Adam B. Birchfield is an Assistant Professor in the Department of Electrical and Computer Engineering. 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.

