



SGC WEBINAR

An Open-access Cross-domain Approach to Analyzing the Impact of Extreme Events on the Electricity Sector: What We Learned from COVID-19 and 2021 Texas Winter Outage

Le Xie

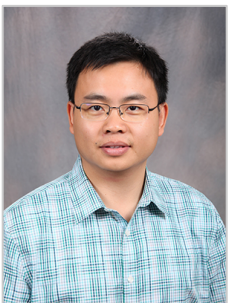
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Extreme events such as COVID-19 and the 2021 Texas power outage are placing increasing amount of operational challenges to the resiliency of the electricity sector. We illustrate an open-access and cross-domain approach to analyzing the short-run impact and corrective measures of these extreme events on the electricity sector. We release a first-of-its-kind cross-domain open-access data hub, integrating data from across all existing U.S. wholesale electricity markets with COVID-19 case, weather, mobile device location, and satellite imaging data. Leveraging cross-domain insights from public health and mobility data, we rigorously uncover a significant reduction in electricity consumption that is strongly correlated with the number of COVID-19 cases, degree of social distancing, and level of commercial activity. For the 2021 Texas power outage, we collaboratively release an open-source extendable model that is synthetic but nevertheless provides a realistic representation of the actual energy grid, accompanied by open-source cross-domain data sets. This simplified synthetic model is calibrated to the best of our knowledge based on published data resources. Building upon this open-source synthetic grid model, researchers could quantitatively assess the impact of various policies on mitigating the impact of such extreme events. This approach and methodology are generalizable for other regions experiencing significant energy portfolio transitions.

September 29, 2021 at 3:00 P.M. CDT

Register in advance at

https://tamu.zoom.us/meeting/register/tJwKf-6rrD8jG9TWwH1utCvjN9EIOWqF_fsS



Dr. Le Xie is a Professor, Chancellor EDGES Fellow, and Presidential Impact Fellow in the Department of Electrical and Computer Engineering at Texas A&M University, and the Assistant Director-Energy Digitization at Texas A&M Energy Institute. He received B.E. in Electrical Engineering from Tsinghua University in 2004, S.M. in Engineering Sciences from Harvard in 2005, and Ph.D. in Electrical and Computer Engineering from Carnegie Mellon in 2009. His industry experience includes ISO-New England and Edison Mission Energy Marketing and Trading. His research interest includes modeling and control in data-rich large-scale systems, grid integration of clean energy resources, and electricity markets.

Dr. Xie received the U.S. National Science Foundation *CAREER Award*, and DOE Oak Ridge Ralph E. Powe Junior Faculty Enhancement Award. He was awarded the 2021 IEEE Technical Committee on Cyber-Physical Systems Mid-career Award, and 2017 IEEE PES Outstanding Young Engineer Award. He was recipient of Texas A&M Dean of Engineering Excellence Award, ECE Outstanding Professor Award, and TEES Select Young Fellow. He serves or have served on the Editorial Board of IEEE Transactions on Smart Grid, IET Transaction on Smart Grid, and Foundations and Trends in Electric Energy Systems. He is the founding chair of IEEE PES Subcommittee on Big Data & Analytics for Grid Operations. His team received the Best Paper awards at North American Power Symposium 2012, IEEE SmartGridComm 2013, HICSS 2019 and 2021, IEEE Sustainable Power & Energy Conference 2019, and IEEE PES General Meeting 2020.