

Converging Cybersecurity Solutions for Energy Systems to Practice

Situational Awareness for Grid Anomalies

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October 18, 2022, 7:00 - 8:00 pm, Israeli time

(12:00-1:00 pm EST, 9:00 am-10:00 am AZ/Pacific Time)

Link: <https://asu.zoom.us/j/6712258140>

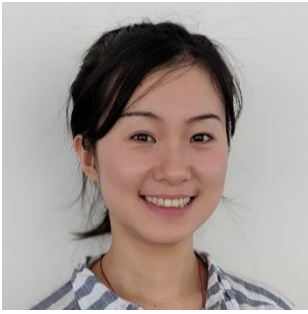
Abstract: The modern power industry becomes more vulnerable to cyber events due to the growing interconnectivity, interdependence, and complexity of the electric power grid. High-fidelity modeling and simulation tools that support the preventative risk analysis on potential cyber-relevant events is essential for ensuring the situational awareness of the system operator as it provides an inexpensive and risk-free environment to test the system responses under various cyber-relevant events, and hereby can support research on cyber anomaly detection, optimal protective resource allocation and mitigation measures. In this webinar, we will share NREL’s cybersecurity research capabilities by highlighting the development of a scalable cyber-physical event test bed and demonstration with real hardware in the loop. The developed cyber-physical event test bed is backboneed by an integrated transmission, distribution, and communication dynamic co-simulation framework and a plug-and-play cyber event generation module. It is designed to be modular and compatible with parallel computing, and thereby supports large-scale system simulations at an affordable computation cost. The test bed can capture millisecond-to-minutes dynamic frequency and voltage responses under cyber events from the bulk transmission system to the active distribution systems and distributed energy resources at the grid edge.

Bio:

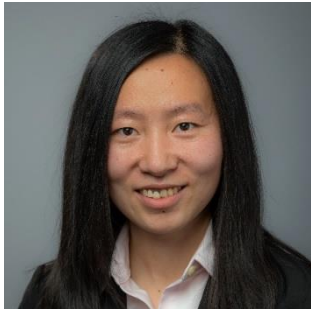


Michael Ingram is a chief engineer in the Power Systems Engineering Center at the National Renewable Energy Laboratory. He serves as P.I. on multiple research projects supporting grid modernization and renewables integration, including cybersecurity. Michael comes to NREL following a 28-year career with the Tennessee Valley Authority (TVA) having served in a variety of roles. Prior to retiring from TVA, he advised and counseled the CEO and senior executives on significant technical, business, and political issues affecting the agency. Michael is a Fellow of the IEEE and a registered professional engineer in Colorado.





Mengmeng Cai received her B.S. degree in electrical engineering from Hunan University, Hunan, China, in 2012, the M.S. degree in electrical engineering from Tianjin University, Tianjin, China, in 2015, and the Ph.D. degree in electrical and computer engineering from Virginia Polytechnic Institute and State University, Arlington, VA, USA, in 2020. She is currently a Research Engineer with the Power Systems Engineering Center, National Renewable Energy Laboratory, Golden, CO, USA. Her research focuses on cyber-physical power system modeling/simulation, DERs-grid integration, and learning-based optimal control.



Rui Yang is the group manager of the Sensing and Predictive Analytics Group in the Power Systems Engineering Center at the National Renewable Energy Laboratory (NREL). Her areas of expertise include advanced data analytics, machine learning, and optimization in electric power systems. She currently leads multiple projects on developing artificial intelligence solutions for power system operations at NREL. She received her Ph.D. degree in Electrical and Computer Engineering from Carnegie Mellon University in 2014 and her B.E. degree in Electrical Engineering from Tsinghua University, China in 2009.

