

# Annual Conference of the IEEE Industrial Electronics Society (IECON 2021)

## Special Session on

### Resilient, Sustainable, and Secure Inverter Intensive Power Grids

#### Organized by

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#### Call for Papers

There are tremendous research efforts and industry practices for promoting technological innovations towards power grid modernization with increasing penetration of inverter-based resources. It is noteworthy that the challenges and R&D advances lie in multiple sections throughout the entire power systems, ranging from grid-edge customers and substations to large-scale distribution systems and upstream transmission networks. Cutting-edge technologies of modern power systems with coupled cyber and physical dynamics, such as networked microgrids, reconfigurable distribution systems with grid-forming inverters, cyber-secure and solid-state power substations, among others, are being developed and field-validated towards resilient, sustainable, and secure power grids with intensive power electronic inverters.

Topics of interest of the proposed special session include, but are not limited to:

- Cyber-physical interactions in inverter dominated power systems
- Grid-forming and grid-following inverter control in modern power grids
- Active stabilization of inverter-based power systems
- Grid integration of energy storage
- Ad-hoc and self-healing individual and networked microgrids for grid resiliency enhancement
- Hybrid AC and DC microgrids
- Cyber- and physical-security assessment and enhancement of grid infrastructures
- Cyber- and physical-secure solid-state power substations
- Transportation electrification and its grid interactions
- Grid codes and standards for grid integration of increasing penetration of inverter-based resources

## Background and Short Bio of the Organizers

Dr. Xiaonan Lu received his B.E. and Ph.D. degrees in electrical engineering from Tsinghua University, Beijing, China, in 2008 and 2013, respectively. From September 2010 to August 2011, he was a guest Ph.D. student at the Department of Energy Technology, Aalborg University, Denmark. From October 2013 to December 2014, he was a Postdoc Research Associate at the University of Tennessee, Knoxville. From January 2015 to July 2018, he was with Argonne National Laboratory, first as a Postdoc Appointee and then as an Energy Systems Scientist. In July 2018, he joined the College of Engineering at Temple University. Dr. Lu's research interests include grid-interactive power electronic inverters, network interconnected hybrid AC and DC microgrids, real-time hardware-in-the-loop testing, among others. He serves as the Principal Investigators (PIs) and co-PIs of multiple projects funded by the U.S. Department of Energy (DOE), Office of Naval Research (ONR) in the U.S. Department of Defense (DOD), Pennsylvania Manufacturing Program, and leading industry (e.g., Siemens Corporate Technology). Dr. Lu is the Associate Editor of IEEE Transactions on Industrial Electronics, the Editor of IEEE Transactions on Smart Grid, the Associate Editor of IEEE Transactions on Industry Applications, and IEEE Power Engineering Letters. Dr. Lu received the Outstanding Postdoc Performance Award from Argonne National Laboratory in 2016. He is also the recipient of the 2020 IEEE Philadelphia Section Young Electrical Engineer of the Year Award.

Dr. Bo Chen received his Ph.D. degree in electrical engineering from Texas A&M University, College Station, USA, in 2017. He received the B.S. and M.S. degrees from North China Electric Power University in 2008 and 2011, respectively. He was a Research Aide with Argonne National Laboratory in 2016 and now he is an Energy Systems Scientist at the Energy Systems Division, Argonne National Laboratory, IL, USA. Dr. Chen's research interests include modeling, control, and optimization of modern power systems with inverter interfaced distributed energy resources, cybersecurity, cyber-physical systems, among others. He serves as the Principal Investigators (PIs) or co-PIs of multiple projects funded by U.S. Department of Energy and leading industry companies. Dr. Chen is the Editor of IEEE Transactions on Smart Grid and IEEE Power Engineering Letters.

Dr. Mo-Yuen Chow earned his degree in Electrical and Computer Engineering from the University of Wisconsin-Madison (B.S., 1982); and Cornell University (M. Eng., 1983; Ph.D., 1987). Dr. Chow is a Professor in the Department of Electrical and Computer Engineering at North Carolina State University. Dr. Chow was a Changjiang Scholar at Zhejiang University. Dr. Chow's recent research focuses on distributed control and management, smart micro-grids, batteries, and mechatronics systems. Dr. Chow has established the Advanced Diagnosis, Automation, and Control Laboratory. He is an IEEE Fellow, the Co-Editor-in-Chief of IEEE Trans. on Industrial Informatics 2014-2018, Editor-in-Chief of IEEE Transactions on Industrial Electronics 2010-2012. He has received the IEEE Region-3 Joseph M. Biedenbach Outstanding Engineering Educator Award, the IEEE ENCS Outstanding Engineering Educator Award, the IEEE ENCS Service Award, the IEEE Industrial Electronics Society Anthony J Hornfeck Service Award, and the IEEE Industrial Electronics Society Dr.-Ing. Eugene Mittelmann Achievement Award. He is a Distinguished Lecturer of IEEE Industrial Electronics Society.

## Sponsoring IES Technical Committee

IEEE IES Technical Committee on Resilience and Security for Industrial Applications (ReSia)