TEXAS A&M UNIVERSITY
Department of Electrical & Computer Engineering

Friday, January 28, 2022 | 9:10 – 10:00 a.m. Central

Location: ETB 1020

Active Distribution Networks: Carbon-free, robust, self-controlled and profitable.

Abstract

Although black-outs which are widely spread through a transmission system are relatively rare, faults and disconnections at the distribution level are notably more frequent and add up to service interruptions of – at least – a few hours per customer every year. At the same time, the restructuring of electricity markets and the calls for the clean energy transition have led policy initiatives, standardization and encouraged the industry to develop energy resources and equipment suited for the distribution grid, its needs and its customers. Finally, from a practical aspect, distribution networks (DNs) are intricate to operate, because they are geographically dispersed with hundreds of buses over dozens of feeders. Hence, the reliability, resilience and quality of service at DNs is a challenging and socially critical task that remains very timely. This task requires accurate monitoring and multi-objective control of DNs, based on suitable hardware, decentralized algorithms (if not fully distributed) and appropriate economies to benefit society in a fairer manner. In this talk, the presenter will review experiences and research outcomes from his works in the industry and the academia, including the digital twin of distribution transformers, distributed optimization of storage systems in DNs with on-roof photovoltaics, and others.

Dr. Panayiotis (Panos) Moutis

Special Faculty with the Scott Institute for Energy Innovation at Carnegie Mellon University

Panayiotis (Panos) Moutis, PhD, has been Special Faculty with the Scott Institute for Energy Innovation at Carnegie Mellon University (CMU) since August. His recent grants include one from the national system operator of Portugal, REN, for the development of a transmission expansion planning platform, and another from the moonshot factory of Google, X, for the digital twin of the electrical grid. Between 2018-20 he served as a Marie Curie Research Fellow with DEPsys, Switzerland, on distribution grid synchronized measurements and state estimation. In 2014 he was awarded a fellowship by Arup UK (through the University of Greenwich), on the “Research Challenge of Balancing Urban Microgrids in Future Planned Communities”. In 2013 he won the “IEEE Sustainability 360o Contest” on the topic of Power. Panos received both his diploma (2007) and his PhD (2015) degrees in Electrical & Computer Engineering at the National Technical University of Athens, Greece, and has published more than 30 papers and contributed to 5 book chapters. He has accumulated over 10 years of industry experience on projects of Renewable Energy Sources and Energy Efficiency, and serves in energy start-ups as advisor and executive. He is a senior member of multiple IEEE societies, member of the IEEE-USA Energy Policy Committee and NASPI, associate editor of IEEE & IET scientific journals, active contributor to IEEE standards working groups, chair of the IEEE Smart Grid Publications Committee and editor-in-chief of the “IEEE Smart Grid Newsletter”. Personal Website for more information: https://panay1ot1s.com/