



# ELECTRICAL & COMPUTER ENGINEERING

TEXAS A & M UNIVERSITY

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2:30 pm

236C WEB

## **Power Systems Monitoring and Control in a Cyber-Adversarial Environment**

**Abstract:** The power grid is a vast and interconnected cyber-physical system for delivering electricity. Treating the grid as a cyber-physical system requires new perspectives, including analysis techniques as well as operating procedures. The role of data in power systems analysis, and hence the importance of studying critical attack surfaces and threats, is understood by considering the data pipeline. Measurements and commands are relayed over a network connecting the control room to devices in the field. Field devices provide critical services, like relaying and system protection. Attacks on the grid could detrimentally affect public health and safety, yet its cyber infrastructure is not currently subjected to the intense analysis of its electrical counterparts. In this talk, we discuss critical attack surfaces of power systems and examine how these systems can be vulnerable to attack. Then, we explore solutions for securing the cyber backbone of grid operations. We highlight the Cyber-Physical Security Assessment (CyPSA) toolset. CyPSA is an online framework that analyzes and prioritizes operational reliability risks due to threats to the cyber infrastructure. The talk emphasizes the importance of cyber components and cyber-physical interdependencies in observing and analyzing complex cyber-physical power systems at scale.

**Bio Sketch:** Katherine Davis is a Research Scientist with the Information Trust Institute as well as an Adjunct Assistant Professor in the Department of Electrical and Computer Engineering at the University of Illinois at Urbana-Champaign. She founded Kaedago, Inc. to provide cyber-physical situational awareness to utilities and has worked as a Software Engineer and Senior Consultant for PowerWorld Corporation. She received her M.S. and Ph.D. degrees in Electrical and Computer Engineering from University of Illinois at Urbana-Champaign in 2009 and 2011 and her B.S. degree in Electrical Engineering from The University of Texas at Austin in 2007. Her interests include data-enhanced power system modeling and analysis, security-oriented cyber-physical techniques to defend electrical and cyber infrastructures, and making algorithms more robust with respect to untrustworthy inputs. Kate is a member of IEEE PES, IEEE COMSOC, ASEE, HKN, and Tau Beta Pi.