



TEXAS A&M UNIVERSITY

Department of Electrical  
& Computer Engineering

TRANSFORMING ENGINEERING EDUCATION

# ENERGY & POWER GROUP SEMINAR

## Resilient-by-Design NextG Power Systems: Challenges and Opportunities

### Abstract

The smart grid is recognized as the most critical infrastructure, where the assumption of reliable and secure availability of electric power underpins the digital revolution transforming our modern lives.



Digital transformation of the smart grid is reshaping the interactions between smart grid systems components, power systems and consumers, and power systems and other interdependent critical infrastructures. Cyber-physical security and resilience are essential enablers for continued innovation; however, existing standards and regulations follow a bottom-up technology-focused approach that may not sufficiently address risks across the smart grid operational layers. In this talk, we expand on the benefits of cyber-physical modeling as a useful tool to help capture innovation, system interactions, risks, and uncertainty. We share results on a few research problems within this framework, and expand on opportunities for research.

**Eman Hammad**  
Assistant Professor  
Engineering Technology & Industrial Distribution  
Texas A&M University

**Friday, April 26**  
**11:30 am**  
**241 ZACH**

### Biography

Dr. Eman Hammad is an interdisciplinary professional who has her PhD in Electrical & Computer Engineering from the University of Toronto. Dr. Hammad investigates how a deeper understanding of interactions between critical infrastructure systems and enabling technologies (communication, intelligence, and control) can help design new classes of operational solutions that are more resilient and secure by design. Her research interests include cyber-physical security and resilience, distributed systems, large-scale complex networks, operational trust and risk-aware coordination. She is the director of the innovations in Systems' Trust & Resilience (iSTAR) lab. Dr. Hammad's research has been published in more than 70 papers and has been recognized with merit awards (Best Paper Award, Best Poster Awards). Most recently, she was honored as one of Canada's Top 20 Women in Cybersecurity. Dr. Hammad is a senior IEEE member serving as the co-chair of the IEEE Future Networks Security working group for the International Network Generations Roadmap (INGR).

**FACULTY CONTACT:**  
Adam Birchfield  
abirchfield@tamu.edu

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