The 11th Annual Exhibition of Undergraduate Research and Creative Activities - EXPO 2024

GUEST SPEAKER

Roy McCann, Ph.D.

**Professor Dept. of Electrical Engineering and Computer Science
Assistant Department Head for Academics & Graduate Coordinator**

University of Arkansas, Fayetteville

April 18, 2024 – 5:00 to 5:45 p.m.
Live Oak Ballroom - Setzer Center

SHORT BIOGRAPHY:

Roy A. McCann received the B.S. and M.S. degrees in Electrical Engineering from the University of Illinois (Urbana-Champaign) in 1990 and 1991, respectively, and the Ph.D. degree in Electrical Engineering from the University of Dayton, (Dayton OH) in 2001.
From 1991 to 1994, he was a member of the engineering staff with General Motors in the development of electric vehicles and electronic chassis controls. From 1994 to 1998, he was a Senior Project Engineer with ITT Automotive (Dayton, Ohio) in the development of electric braking systems. From 1998 to 2003, he was with Delphi Automotive in Saginaw Michigan, as the Supervisor of the Electrical Systems Group in developing electric power steering systems. He joined the Faculty of the Department of Electrical Engineering, University of Arkansas (Fayetteville) in 2003, as an Associate Professor, and then appointed to the rank of Professor in 2009. Dr. McCann is the site director for the NSF Center for Grid-Connected Advanced Power Electronics (GRAPES) and a senior researcher in the Center for Artificial Intelligence in Sustainable Energy Networks (AI-SUSTEIN). Dr. McCann is an inventor on 22 issued US patents and an author on over 100 published peer-reviewed articles. He is a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) and a registered Professional Engineer (Ohio). His research is in the modeling and control of renewable energy systems, grid modernization using power electronics, and the development of machine learning algorithms for improved power system reliability and resilience.

LECTURE: Artificial Intelligence as the Gateway Technology for a Resilient Future Energy Transition

The North American cold weather event in February 2021 resulted in more than 10 million people without electricity. In Texas, the economic disruption is estimated to have been $130 billion. It was reported that almost 250 deaths were attributed to the 2021 winter storm. Moreover, these blackouts occurred shortly after 2020 was recorded as the worst year for electric power outages as a result of five hurricanes impacting the Louisiana gulf coast. As the electric power generation mix shifts towards variable energy resources such as wind and solar, there will be increasing demands on meeting the needs for reliable electric power delivery for industrial, commercial and residential customers. This talk gives an overview of the contemporary landscape for electric power production and consumption in North America. This includes the expansion of electricity markets throughout the United States and increasing electricity demand for transportation electrification. The presentation provides a forward-looking vision for the use of emerging technologies such as artificial intelligence and machine learning in balancing power generation and load demand. This is enabled by ongoing improvements in power electronics and digital communication technologies that will help meet future electrical energy needs and ensure economic growth and security.

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