

## IEEE-PEAL Chapter Technical Talk



**Presentation:** GaN and SiC Switched Tank Converter for Data Center and Electric Vehicle

**Who:** Professor Dong Cao, University of Dayton

**Date:** Wednesday, November 13, 2019

**Place:** University of Dayton Research Institute, Curran Place – Rm. S1050 (Auditorium)  
1700 South Patterson Blvd, Dayton, OH 45409 (originally NCR-HQ building, River Campus)

**Parking:** Park in lot to right of main building. Proceed to Auditorium via adjacent rear entrance.

**When:** 6:00 pm Light Buffet and Refreshments (complimentary), 6:15 pm Presentation Begins

**RSVP:** IEEE members may bring one non-IEEE member as a guest. Please reply through the PEAL website (<http://site.ieee.org/dayton-peal/rsvp/>) ASAP, whether attending as self or self plus guest. Questions should be directed to Bang Tsao ([bang.tsao@udri.udayton.edu](mailto:bang.tsao@udri.udayton.edu)).

**Abstract:** The modernization of the current power grid faces several challenges including optimally integrating multiple energy sources amid more difficult demand/source variability and cybersecurity concerns. In this talk, I will present an overview of the current energy source power management techniques which includes multiple layers; from local power electronics/field control to optimization approaches such as economic dispatch, optimal power flow, and unit commitment. In addition, I will discuss a few of the current challenges and research directions with regards to the latter, such as the dealing with nonconvex problems (e.g. optimal power flow) and optimization in very large power networks. Lastly, the applications of these methods to shipboard and aircraft microgrids will also be discussed.

**Speaker's Bio:** Dong Cao received the B.S. degree from Zhejiang University, Hangzhou China, in 2005, the M.S. and Ph.D. degrees in electrical engineering from Michigan State University, East Lansing USA, in 2010 and 2012, respectively. He worked at Ford Motor Company as a core power electronics engineer for hybrid electric vehicle electrified driveline hardware development from 2012 ~ 2014. He was an assistant professor at North Dakota State University from Aug. 2014 to Aug. 2019. He joined University of Dayton as GE EPISCenter Professor and Associate Professor in Aerospace Electric Power Systems since Aug. 2019. His research interests include emerging applications utilizing high power or high frequency wide bandgap devices e.g. SiC or GaN; high density power conversion using innovative topologies for data center and transportation electrification; health monitoring and lifetime prediction of power converters. He is the associated editor for the IEEE Journal of Emerging and Selected Topics in Power Electronics.