

THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING SPEAKER SERIES

PRESENTS

A Flexible Microgrid with a Low-Cost Open-Source Controller

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ZOOM meeting room (Meeting ID: 976 269 9678 | Passcode: K91Bwy):

<https://zoom.us/j/9762699678?pwd=RUp5ZmN3cHUyQ1FvUEExVQjVsc1hVUT09>

LECTURE ABSTRACT

This talk will be mainly based on the research results of the US ARPA-E funded microgrid controller project at CURENT Center, University of Tennessee. The general microgrid and microgrid controller concept and status will be first reviewed. The challenges and limitations with the conventional microgrid and its controller for communities or utilities applications will be identified. The concept of the flexible microgrid with dynamic boundaries and multiple interface points based on a smart distribution system will be introduced, together with the strategy for a corresponding low cost controller. The main objectives, technical approaches, and status will be presented. Several key accomplishments and technical findings will be the focus of the talk, including microgrid design considering reliability and resilience requirements, control architecture and strategies considering dynamic boundaries, protection considerations, test implementations in hardware-in-the-loop, CURENT hardware testbed, and field tests. The practical application of the developed microgrid concept and its controller will also be discussed.

SPEAKER BIOSKETCH

Dr. Fred Wang has been a professor and Condra Chair of Excellence in Power Electronics at the University of Tennessee, USA since 2009. He holds a joint position in Oak Ridge National Lab. He is the Technical Director of CURENT. His experience also includes 8 years as an associate professor and the Technical Director at the Center for Power Electronics at Virginia Tech, and 10 years as an engineer and R&D manager at General Electric. His interests include power electronics and power systems. He is a fellow of the IEEE and a fellow of the US Academy of Inventors.

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