Electric Power and Power Electronics Institute

WEEKLY SEMINAR SERIES – FALL 2017

Monday, October 2nd, 2017, 3:00 – 3:30 p.m., ETB 1003

POWER FLOW CONVERGENCE AND REACTIVE POWER PLANNING IN LARGE SYNTHETIC GRIDS

Ph.D Candidate Adam B. Birchfield

Department of Electrical and Computer Engineering, Texas A&M University, College Station

Abstract

To encourage and support innovation in power systems engineering, synthetic power grids provide test cases that are free from the confidentiality restrictions that come with models of actual grid infrastructure. Synthetic cases are designed to match realistic properties of actual grids, as specified in statistics and metrics. In order to scale these systems to ten thousand buses and beyond, robust reactive power planning is needed, accounting for power flow convergence issues. This presentation addresses reactive power planning and power flow convergence in the context of large synthetic power grids. An iterative algorithm is presented that supplements a dc-validated transmission network with the controls it needs to meet the statistics given, even with the constraints of power flow convergence for large systems. Then, an example ten thousand bus system is introduced, matching the specified properties, publicly available, and useful for a variety of research studies.

Biography

Adam B. Birchfield received the B.E.E. degree in 2014 from Auburn University, Auburn, AL, USA, and the M.S. degree in electrical and computer engineering in 2016 from the University of Illinois at Urbana-Champaign, Urbana, IL, USA. He is now pursuing the Ph.D. degree in electrical engineering at Texas A&M University, College Station, TX, USA.

Electric Power and Power Electronics Institute

WEEKLY SEMINAR SERIES – FALL 2017

Monday, October 2nd, 2017, 3:30 – 4:00 p.m., ETB 1003

AN INTEGRATED ENVIRONMENT FOR THE STUDY OF PMU DATA ERRORS

Ph.D Candidate Ikponmwosa Idehen

Department of Electrical and Computer Engineering, Texas A&M University, College Station

Abstract

The pervasive use of phasor measurement units (PMUs) to monitor the health of the power grid stimulates innovative ideas in the data quality aspects of power systems. Integration of the working mechanisms of the GPS and other PMU device timing features has introduced newer data quality issues (especially pertaining to time-based errors) which data centers need to tackle in order to preserve the integrity of recorded data. In this presentation, I will be talking about an ongoing integrated framework for the study of PMU data errors. Some of the mechanisms associated with these errors will be discussed, and a time series query search algorithm to detect errors will be presented. More importantly, as PMU data lifecyle management becomes critical,we propose a method for the detection of time-based errors by solely relying on observed prototype patterns and recorded voltage angle measurements.

Biography

Iyke obtained his B.Eng in Electrical and Electronics Engineering from the University of Benin, Nigeria and an M.Sc degree in Electrical and Computer Engineering from Tuskegee University Alabama. A transfer student from the University of Illinois, Urbana-Champaign, Iyke is currently pursuing a Ph.D degree in Electrical Engineering here in Texas A&M University, College Station.