Announcing the Final Examination of Stuart Laval for the degree of Doctor of Philosophy

Time & Location: March 24, 2015 at 11:00 AM in Engineering II 312L
Title: A Framework for Interoperability on the United States Electric Grid Infrastructure

Historically, the United States (US) electric grid has been a stable one-way power delivery infrastructure that supplies centrally-generated electricity to its predictably consuming demand. However, the US electric grid is now undergoing a huge transformation from a simple and static system to a complex and dynamic network, which is starting to interconnect intermittent distributed energy resources (DERs), portable electric vehicles (EVs), and load-altering home automation devices, that create bidirectional power flow or stochastic load behavior. In order for this grid of the future to effectively embrace the high penetration of these disruptive and fast-responding digital technologies without compromising its safety, reliability, and affordability, plug-and-play interoperability within the field area network (FAN) must be enabled between operational technology (OT), information technology (IT), and telecommunication assets in order to seamlessly and securely integrate into the electric utility’s operations and planning systems in a modular, flexible, and scalable fashion.

This research proposes a potential approach to simplifying the translation and contextualization of operational information on the electric grid without being routed to the utility datacenter for a control decision. This methodology integrates modern software technology from other industries, along with utility industry-standard semantic models, to overcome information siloes and enable interoperability. By leveraging industrial engineering tools, a framework is also developed to help devise a reference architecture and use-case application process that is applied and validated at a US electric utility.

Major: Industrial Engineering

Educational Career:
Bachelor's of Electrical Engineering & Computer Science, BS, 2004, Massachusetts Institute of Technology
Master's of Electrical Engineering & Computer Science, MS, 2004, Massachusetts Institute of Technology
Master's of Business Administration, MBA, 2009, Rollins College

Committee in Charge:
Luis Rabelo, Chair, Industrial Engineering & Management Systems
Qipeng Zheng, Industrial Engineering & Management Systems
Petros Xanthopoulos, Industrial Engineering & Management Systems
Richard Ajayi, Finance and International Business

Approved for distribution by Luis Rabelo, Committee Chair, on February 17, 2015.

The public is welcome to attend.