Center of Excellence in Intelligent Engineering Systems

SEMINAR

Speaker: Dr. Thamer S. Alquthami
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Thamer Alquthami received his B.Sc in EE from KAU in 2005, M.Sc in EE from Florida State University in 2011, and Ph.D in EE from Georgia Institute of Technology in 2015. He worked for SABIC from 2005 to 2007. He was a research associate at the Center for Advanced Power Systems (CAPS) in the State of Florida from 2008 to 2011, where worked on several research projects. He worked as a research and teaching assistant at the power system control and automation laboratory at Georgia Tech. He did several internships and has several publications. He is now an assistant professor at the ECE dept. and he is looking for more challenging research opportunities in the area of smart & intelligent electrical systems, modeling and simulation of complex systems, and renewable energy integration.

Date: **Monday, November 2, 2015**
Time: **1:00 PM**
Venue: **Engineering Building, Third floor, Dean of Engineering Meeting Room**

Title

A Smart House Energy Management System

Abstract

The objective of this research is to design a smart house energy management system that can optimize and control the electric power operation of a house without inconvenience to the customer. The impact of distributed energy resources (DERs), electric vehicles/plug-in hybrid electric vehicles (EVs/PHEVs), and smart appliances on the power grid has been thoroughly studied from different aspects. The results of these studies suggest the following: (a) the impact, generally, is beneficial in terms of environment, economy, and reliability; however, it can be more beneficial by implementing controls to maximize the beneficial impact and (b) in absence of additional controls, a negative effect was identified regarding the service lifetime of power distribution system components such as the distribution transformers. This unfavorable effect, however, is manageable by appropriately designed control strategies. The same control infrastructure can be used to maximize the benefits of integrating DERs, EV/PHEV, and smart appliances. The management of the house resources requires properly designed control algorithms for the coordinated use of smart devices and intelligent control of charging cycles of EV/PHEV and the battery bank and controlled loading of distribution components such as transformers. The implementation and management of these controls requires an infrastructure that continuously monitors the house system operation, determines the real-time model of the house, computes better operating strategies, and enables control of house resources

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