

Electric Power and Power Electronics Institute

INVITED SEMINAR

Monday, February 23rd, 2015, **3:00pm – 3:50pm, ETB 1003**
(Special Time)

TITLE

COOPERATIVE CONTROL FOR TRANSIENT STABILIZATION USING POWER-ELECTRONICS

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Abstract

As the number of wind and solar power plants increases while aged coal-fired power plants are being decommissioned, the dynamic behavior of the interconnected grid is altered in unforeseen ways. Despite the evolving grid behavior, the requirements for satisfactory dynamic response, i.e. guaranteed stability, uncompromised integrity, and ensured quality of electric power, remain the same. In this talk, we consider a problem of designing stabilizing controllers for future electric energy grids. The main premise of the talk is that the interconnected power system stability can be ensured in cooperation between devices. To this end, a modular hierarchical approach to modeling interconnected power system dynamics is proposed. The approach is unique in the sense that it represents dynamical interactions between grid components as dynamical states of the model. It is shown that this hierarchical model is suitable for design of cooperative controllers, particularly for line-flow power electronics.

Speakers Bio

Milos Cvetkovic is a postdoctoral researcher at the Mechanical Engineering Department, Massachusetts Institute of Technology. He received an M. S. and a Ph. D. degree in Electrical and Computer Engineering from Carnegie Mellon University. His research interests are in the areas of electric energy grid dynamics, modeling and control of large scale systems dynamics, and applied control theory for stabilization of power systems.