

Electric Power and Power Electronics Institute

WEEKLY SEMINAR SERIES – FALL 2017

Monday, November 13th, 2017, 11:00 a.m. – 12:00 p.m., WEB 236C

DISTRIBUTED ENERGY MANAGEMENT WITH LIMITED COMMUNICATION

Na Li
Harvard University

Abstract

A major issue in future power grids is how intelligent devices and independent producers can respectively change their power consumption/production to achieve near maximum efficiency for the power network. Limited communications between devices and producers necessitates an approach where the elements of the network can act in an autonomous manner with limited information/communications yet achieve near optimal performance. In this talk, I will present our recent work on distributed energy management with limited communication. In particular, I will first show how we can extract information from physical measurements and develop fast and closed-loop decentralized control algorithms. I will focus on frequency control in transmission systems and voltage control in distribution systems. Then I will present how to recover information from local computation by studying a general class of quantized gradient methods and its use for the optimal energy management in the grid.

Biography

Na Li is an assistant professor in Electrical Engineering and Applied Mathematics of the School of Engineering and Applied Sciences in Harvard University since 2014. She received her Bachelor degree in Mathematics in Zhejiang University in 2007 and PhD degree in Control and Dynamical systems from California Institute of Technology in 2013. She was a postdoctoral associate of the Laboratory for Information and Decision Systems at Massachusetts Institute of Technology 2013-2014. Her research lies in distributed optimization and control of cyber-physical networked systems. She received NSF career award (2016) and AFSOR Young Investigator Award (2017). She entered the Best Student Paper Award finalist in the 2011 IEEE Conference on Decision and Control.