SEMINAR NOTICE

Preston M. Green Department of Electrical and Systems Engineering

PARALLEL LOAD SCHEDULE OPTIMIZATION WITH RENEWABLE DISTRIBUTED GENERATORS IN SMART GRID

PhD Preliminary Research Examination

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Abstract: The smart grid includes advanced technologies in sensing, communication and control. We propose a framework for load scheduling in smart grid that integrates renewable distributed generators (DG). In this model, users are equipped with advanced metering infrastructures (AMI) and energy management controllers (EMC), which enable communications with the utility and algorithm-controlled load scheduling, respectively. Some users have DGs and can generate part of their electricity. They can also sell extra power generation to the utility company. Our goal is to optimize the load schedule of users to minimize the utility company's cost and user payments, while considering user satisfaction. We employ a parallel autonomous optimization scheme, where each user requires only the knowledge of the aggregated load of other users, instead of the load profiles of individual users. All the users can execute distributed optimization simultaneously. The distributed optimization is coordinated through a soft constraint on changes of load schedules between iterations. Numerical results show that our method can significantly reduce the peak-hour load and costs to both the utility and users. Since the autonomous user optimization is executed in parallel, our method also significantly decreases the computation time and communication costs.

DATE: Monday, April 1, 2013
TIME: 2:10 p.m.
PLACE: Green Hall, Room 0120

Dissertation advisor:
Dr. Arye Nehorai

This seminar is in partial fulfillment
of the Doctor of Philosophy degree

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