

Title: Demand Side Management Strategy for the Smart Grid

Speaker:

Dr. Vincent Wong
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Date: Wednesday, 14 December 2011

Time: 11:00 am – 12:00 noon

Venue: Room 603, Chow Yei Ching Building

Abstract:

Demand side management commonly refers to programs implemented by utility companies to control the energy consumption at the customer side of the meter. In this seminar, we first introduce different types of demand side management programs. Then, we present an autonomous and distributed demand side energy management system among users that takes advantage of a two-way digital communication infrastructure which is envisioned in the future smart grid. We use game theory and formulate an energy consumption scheduling game, where the players are the users and their strategies are the daily schedules of their household appliances and loads. It is assumed that the utility company can adopt adequate pricing tariffs that differentiate the energy usage in time and level. We show that for a common scenario, with a single utility company serving multiple customers, the global optimal performance in terms of minimizing the energy costs is achieved at the Nash equilibrium of the formulated energy consumption scheduling game. The proposed distributed demand side energy management strategy requires each user to simply apply its best response strategy to the current total load and tariffs in the power distribution system. The users can maintain privacy and do not need to reveal the details on their energy consumption schedules to other users. We show that users will have the incentives to participate in the energy consumption scheduling game and subscribing to such services.

Biography of the speaker:

Vincent Wong is an Associate Professor in the Department of Electrical and Computer Engineering at the University of British Columbia, Canada. His research areas include protocol design, optimization, and resource management of communication networks, with applications to the Internet, wireless networks, smart grid, RFID systems, and intelligent transportation systems. Dr. Wong is an Associate Editor of the IEEE Transactions on Vehicular Technology and is the Symposium Co-chair of IEEE Globecom'11, Wireless Communications Symposium. <http://www.ece.ubc.ca/~vincentw/>

Organizer: Prof. R.Y.K. Kwok