EE 500E Energy & Environment Seminar

Title: *Aggregation of Flexible Consumer Assets in Smart Grids*

Speaker: Jakob Stoustrup, Pacific Northwest National Laboratory (PNNL)

Location: MGH 241, UW campus

Map: http://www.washington.edu/maps/?l=MGH

Time and Date: 4:30 PM, Thursday, November 6, 2014

Abstract:

One of the visions of the so-called smart grid is to exploit consumer flexibility in order to alleviate the adverse effects of intermittent power production as the penetration of e.g. wind and solar energy resources increase. In this presentation, we present an architecture for aggregation and control of a portfolio of flexible consumers. The architecture makes it possible to control the aggregated consumption of the portfolio to follow a power reference while honoring local consumer constraints. Hereby, an aggregator is able to utilize a portfolio of consumers as a virtual power plant to deliver services in the electricity markets. The architecture is implemented and demonstrated in a field test on a portfolio consisting of a number of heat pumps each located in an inhabited household.

*Jakob Stoustrup* is a Chief Scientist at PNNL in Richland, where he leads the Control of Complex Systems Initiative. He has an M.Sc. in EE and a Ph.D. in Applied Mathematics from the Technical University of Denmark, and was a Professor of Automation & Control at Aalborg University, Denmark prior to coming to PNNL. His research contributions have been to robust control theory, to model predictive control theory and to the theory of fault tolerant control systems. With co-workers, he has proposed a novel Plug-and-Play Control framework.

An IEEE Senior Member, Dr. Soustrup is Vice-Chair of the IEEE CSS Technical Committee on Smart Grids, and has been nominated to be its Chair. He is also a member of the IEEE Technical Committee on Power Generation. In 2013, he was appointed as the first IEEE CSS Wikipedia Editor, in cooperation with IFAC, the International Federation of Automatic Control. Dr. Stoustrup has chaired and participated in IFAC technical committees. He has received the Statoil Prize and the Dannin Award for Scientific Research. He has been a member of the European Research Council as well as the Danish, Norwegian and Swedish Research Councils. He is a member of The Danish Academy of Technical Sciences, where he has acted as a Board Member.