Spring 2014 Seminar:
EE392n – Intelligent Energy Systems: Big Data

Time: Tuesdays, 4:15-5:05pm
Venue: Hewlett, Room 102
Coordinators: Dan O'Neill and Dimitry Gorinevsky, Consulting Professors
Prerequisites: (helpful but not required) Basic statistics, systems, or control
Website: http://www.stanford.edu/class/e392n/

Course Description

Many recent developments in sustainable energy are driven by information system technologies. Because of the sheer size of the energy systems, they generate huge amounts of that are beyond capabilities of traditional data processing tools. This is known as Big Data problem and is at the center of the current technology transformation wave. Intelligent analytical processing of energy data can bring many benefits in dealing with energy supply, demand, distribution, and storage challenges as well as in operation and management of many expensive assets in the energy systems. This intelligence is implemented in computing systems as analytical functions that process real time and historical data to enable monitoring, management, and optimization. The Big Data analytics for energy systems that extract value from all available data is at the center of the current Internet of Things (Industrial Internet) boom.

The course will focus on Big Data applications in modern energy systems. It will discuss both analytical applications (Data Science) and the computing and communications infrastructure required to support such applications. The goal of the course is to prepare the students for careers in the industry by teaching systems engineering perspective. Another goal is to help distinguish between the hype and genuine technology trends and opportunities. To do that, the examples and case studies illustrating the Big Data analytics functions and information systems in energy will be presented by prominent guest lecturers from leading companies.

The list of the lectures is as follows:
1. Introduction. Big Data Analytics in Energy: Dimitry Gorinevsky and Dan ONeill
2. Industrial Internet in Energy Enterprises: GE Corporate
3. Revenue Protection in Smart Energy Networks: Oracle
4. Asset Management in Intelligent Energy Systems, ABB (Ventyx)
5. Streaming Data from Smart Meters: Siemens (Emeter)
6. Information Technology Solutions for Power and Utilities: Microsoft
7. Feature Selection in Energy Data: Ayasdi
8. Improving Energy Efficiency with Big Data from Smart Meters: OPower
9. Software Application for Energy: GE Software