

Spring 2013 Seminar:

EE392N – Intelligent Energy Systems: Energy and Big Data

Time: Tuesdays, 4:15-5:05pm
Venue: Meyer Library, Room 143
Coordinators: Dan O'Neill and Dmitry Gorinevsky, Consulting Professors
Prerequisites: (helpful but not required) Basic statistics, systems, or control
Website: <http://www.stanford.edu/class/e392n/>

Course Description

The technology boom in energy sustainability is driven, in part, by modern information system technologies. Energy systems must have the intelligence to cope with rapid changes in energy supply, demand, distribution, and storage. This intelligence is implemented in computing systems as analytical functions that process real time and historical data to enable monitoring, management, and optimization. Smart components of electrical grid generate huge amounts of M2M (machine-to-machine) data. Analytical processing of such data, Big Data analytics, is at the center of current information technology boom.

The course will focus on Big Data applications in modern energy systems. It will discuss both Data Science techniques and the infrastructure required to support such techniques. The goal of the course is to prepare the students for careers in the industry by teaching systems engineering perspective. The course will discuss analytics for monitoring of the power generation systems, power transmission and distribution systems, asset management, and energy use in buildings. The examples and case studies illustrating the analytics functions and information systems in energy will be presented by prominent guest lecturers from industry.

The list of the lectures is as follows:

1. Introduction to Data Sciences in Energy: Dan O'Neill and Dmitry Gorinevsky
2. Feature Selection in Energy Data: Ayasdi
3. Internet of Things and Energy: GE Energy
4. Energy Insights from Big Data: OPower
5. Multi Objective Optimization in Energy: GE Energy
6. Advanced Metering Infrastructure (AMI) Streaming Sensor Data: Emeter/Siemens
7. Data Management Architecture: HP
8. Monitoring of Transmission and Distribution (T&D) Systems: EPRI
9. Energy Analytics Applications: C3
10. Risk Analytics Applications and Vision: IBM