Seminar: "E-Energy –
Information Systems and Machine Learning
for the Smart Grid"
(with "Topics" option on request)

Summer Term 2016

Course Description:

Electricity used to be generated in large power plants close to the areas where the energy was used. The rise of wind and solar power has changed this traditional paradigm and created new problems for energy distribution. In addition, the deregulation of the energy market, the introduction of a range of new subsidies and the necessity of providing a secure and reliable energy supply have turned the energy sector into a very complex industry.

Information systems (IS) contribute in many ways to make the power system more efficient and its complexity more manageable. At home, they allow people to reduce their overall energy consumption and to align electricity demand with the generation from renewable sources. They enable the grid operator to integrate intermittent renewable sources and allow for an efficient exchange of information in energy trading. They support new data-centric business models and ease the coordination between the players in the energy market. Information systems lessen the trade-off between comfort and sustainability in energy consumption and are an integral part of the change in the energy sector.

In this seminar, we will research on economic and technological aspects in the modern energy sector, in particular on these fields:

• Integration of distributed generation (e.g. solar power) into the grid

• Machine learning for energy efficiency in industrial companies using smart meter data

• The role of battery storages as capacity provider in energy markets

• The trade-off between economic efficiency and privacy aspects in the smart grid

• Methods and architectures to handle conflicting roles and to preserve Privacy

• IS and operations research for grid expansion planning

The research in this area is highly interdisciplinary. It combines methods from economics, computer science as well as electrical engineering. We will fit the topics to your preferences and skills. They can range from theoretical research to the development and implementation of prototypes of information systems.

Target Group:

This Seminar specifically addresses students in the M.Sc. Economics and M.Sc. VWL programs. Interested and committed B.Sc. M.Sc candidates from Computer Science are encouraged to apply for specific topics. VWL and BWL students may also participate.

Organization:

The seminar is held collaboratively by the Chair for Telematics and the Chair for Information Systems Research of the University of Freiburg in Cooperation with Fresenius Institute. The final presentations are intended to be combined with an excursion to Fresenius Institute Frankfurt.

Registration: from February 18, 2016 to April 17, 2016

Application via email to gunther.gust@is.uni-freiburg.de with the following details:

- First name, last name, matriculation number

- Study program, semester

- Transcript of records with previous grades

- Short letter of motivation (5-10 sentences) stating why you want to participate particularly in this seminar

- CV

Response whether application was successful will be sent out in the same week of the registration deadline.

First meeting: **April 25th, 2016 14:00 – 15:30 pm**

Room 2330, KG2

Final presentation: July 2016 (date to be announced)

Communication:

All announcements, handouts, etc. will be sent via email.

Topics:

Exact topics along with hints on literature will be announced together with the response to your application.

Upon request, this course can count as a "Topics" course if the student fulfils the eligibility. If so, the student is required to extend the paper and adapt it to a conference form/layout.

Policies and Procedures

Grading: Draft of seminar paper, corrected and final version thereof (about 10 to 15 pages) and final presentation

Credit points: 6

Credit points are applicable to: Wirtschaftsinformatik, BWL

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