



Seminar: “E-Energy – Information Systems and Analytics for Smart Energy Systems”

Summer Term 2017

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, topics include:

- Business intelligence for energy efficiency in industrial companies
- Data-driven maintenance planning of wind parks
- Integration of distributed generation (e.g. solar power) into the grid
- Grid expansion planning using techniques from operations research
- The role of battery storages as capacity provider in energy markets
- Novel business models enabled by smart-meter data
- Analysis and design of energy markets

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 range from theoretical research to the development and implementation of prototypes of information systems. Additionally, students are typically required to conduct a quantitative analysis based on real-world data (preferably in R).

Target Group:

This Seminar addresses students pursuing a Master's degree in Economics, VWL, BWL, as well as Computer Science. Interested and committed B.Sc. candidates are encouraged to apply as well. Further details are given in the "Credit points" section.

Organization:

The seminar is held by the Chair for Information Systems Research of the University of Freiburg.

Registration: from February 18, 2017 to April 26, 2017

The grading will take into account the study level (Bachelor/Master) of the individual participant.

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) including your interests and skills
- CV

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

First meeting: **April 28, 2017 09:00 am**

Room 2330

Paper draft due: June 2017 (one week ahead of the oral presentation, date to be announced)

Oral presentation: June 2017 (date to be announced)

Final paper due: August 2017 (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.

Policies and Procedures**Grading:**

Draft of seminar paper (30%), presentation (30%), final paper (about 10 to 15 pages, 40%). In addition, you have to hand in your programming code (if applicable). The grading will take into account the study level (Bachelor/Master) of the individual participant

Credit points:

6

Applicable to:

B.Sc. BWL PNPM: Allgemeine BWL
B.Sc. VWL: BWL, Wirtschaftsinformatik
M.Sc. BWL PNPM: Allgemeine BWL, Wirtschaftsinformatik
M.Sc. VWL (2011): BWL, Wirtschaftsinformatik
M.Sc. VWL (2014): Business Analytics
M.Sc. Economics: Elective in Information Systems and Network Economics profile
M.Sc. Computer Science: Wahlmodule BWL und VWL

Chair:

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