Seminar: "E-Energy – Business Intelligence and Information Systems for the Smart Grid"

Winter Term 2016/2017

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, in particular on these fields:

- 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 and devices as capacity provider in energy markets

- The emergence of new business models based on the sharing economy concept

- Use of blockchain technology for balancing energy, microgrids and smart meter operation

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 might be required to conduct a quantitative analysis based on real-world data (in Excel or 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 collaboratively by the Chair for Telematics and the Chair for Information Systems Research of the University of Freiburg in cooperation with the Institute of Energy Economics at the Fresenius University of Applied Sciences.

Registration: from July 15, 2016 to September 30, 2016

Application via email to stefan.reichert@iig.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 (optionally)

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

First meeting: **November 7th, 2016 14:00 – 15:30 pm**

Seminar room 2nd floor, Institute of Computer Science and Social Studies (IIG), Friedrichstr. 50

Paper draft due: Beginning of January 2017 (date to be announced)
Oral presentation: End of February 2017 (date to be announced)
Final paper due: End of February 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, corrected and final version thereof
                                     (about 10 to 15 pages) and presentation

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

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