

Seminar: Business Analytics: Applied Statistical Modeling and Optimization

Summer Semester 2017

Course Description:

Prior to the start of the Information Age in the late 20th century, companies were forced to collect data from non-automated sources manually. Companies back then lacked the computing capabilities necessary for data to be analyzed, and as a result, decisions primarily originated not from knowledge but from intuition. With the emergence of ubiquitous computing technology, company decisions nowadays rely strongly on computer-aided “**Data Mining**”.

In this seminar, we will focus on what distinguishes the varying capabilities across Data Mining – namely the underlying methods. We will review different strategies for data collection, data analysis, and data visualization. Sample approaches include dimension reduction of big data, data visualization, model selection, clustering and forecasting.

In particular, the seminar will address the following topics:

- **Bayes-Statistics:** We will look into the methodological basics of Bayesian statistics, computational procedures (Markov-Chain Monte Carlo, etc.) and implementations thereof.
- **Optimization:** We will look into advanced topics in optimization, such as dynamic programming and optimization of network structures.

Individual assignments will consist of a specific problem from out of the two mentioned fields. Participants will be asked to summarize methodological foundations and implement sample problems, e.g. in R, Python or STAN.

Target Group:

This Seminar specifically addresses students all IMP disciplines, as well as in the M.Sc. Economics and M.Sc. VWL programs. Interested and committed B.Sc. VWL and BWL students may also participate.

Organization:

Registration: from February 20, 2017 to April 20, 2017

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

- First name, last name
- Matriculation number (Matrikelnummer)
- Email, phone number
- Study program, semester
- Previous grades in statistics, econometrics and computational economics

Response whether application was successful in the beginning of May, 2017

First meeting: **May 10, 2017 at 2 pm.**

Room 2330

Final presentation: In July or 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 at a later point. Each participant will give an introduction into a specific library from the statistics software "R".

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, adapt it to a conference form/layout.

Policies and Procedures**Grading:**

Draft of seminar paper (about 10 to 15 pages), corrected version thereof and presentation
The seminar paper can be written in English only.

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

Credit points:

6

Credit points are applicable to:

Wirtschaftsinformatik, BWL

Chair:

Prof. Dr. Dirk Neumann
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