

Visualization

Single subject and programme course

6 credits

Visualisering

732A39

Valid from:

Determined by

The Quality Board at the Faculty of Arts
and Sciences

Date determined

2009-03-20

Revision date

2013-03-18

Main field of study

Statistics

Course level

Second cycle

Advancement level

A1X

Entry requirements

For acceptance to the course, the student must have a bachelor's degree with a total of at least 90 ECTS credits (1.5 years of full-time studies) in mathematics, applied mathematics, statistics, and computer science. The undergraduate courses in mathematics should include both calculus and linear algebra. The student should also have passed courses corresponding at least 5 ECTS in data mining or equivalent, 5 ECTS in basic statistics and 5 ECTS in programming. Documented knowledge of English equivalent to Engelska B/Engelska 6 internationally recognized test, e.g. TOEFL (minimum scores: Paper based 575 + TWE-score 4.5, and internet based 90), IELTS, academic (minimum score Overall band 6.5 and no band under 5.5), or equivalent.

Intended learning outcomes

After completion of the course the student should be able to:

- describe major principles for data visualization using static , interactive or dynamic graphs
- select suitable static, interactive or dynamic visualization techniques for common problems in data visualization,
- produce simple graphs used for analysis and high-quality graphs used for publications
- use up-to-date open-source and commercial visualization tools to describe the structure of a large and complex data sets, and also discover the hidden patterns and trends in the data
- have knowledge of visualization methods present in recent research publications

Course content

The course comprises:

- principles of correct data visualization and misleading graphs,
- static tools used for visualizing univariate and bivariate data sets: histograms, bar charts, scatter plots, time series plots,
- visualizing of textual information: word trees and word clouds,
- static tools used for multidimensional data: scatter plot matrices, treemaps, heatmaps, bubble plots, Chernoff faces, star charts, parallel coordinate plots,
- visualization by means of multidimensional scaling,
- visualizing geographical information by using web applications and standalone software,
- creating animation by combining static graphs,
- animated bubble plots,
- interactive visualization tools: linked graphs, brushing, identification and guided tours,
- producing publication- and presentation-quality graphics from simple graphs.

Teaching and working methods

The teaching comprises lectures, seminars, and computer exercises. Lectures are devoted to presentations of theories, concepts and methods. Computer exercises provide practical experience of data visualization. The seminars comprise student presentations, discussions of the computer assignments and presentation of research papers related to visualization.

Examination

Written reports on computer exercises. Obligatory presence at the seminars. Obligatory presentation of a research article. One final written or oral examination.

Grades

ECTS, EC

Other information

Planning and implementation of a course must take its starting point in the wording of the syllabus. The course evaluation included in each course must therefore take up the question how well the course agrees with the syllabus. The course is carried out in such a way that both men's and women's experience and knowledge is made visible and developed.

Department

Institutionen för datavetenskap