Algorithms and Data Structures

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The goal of this course is to give the students an understanding of the concrete implementation of frameworks, and how to do it right. The students will implement classic algorithms and data structures, learn how to compare them, and perhaps create their own.

The more data you get, the more important the underlying algorithms becomes and data structures used. When the data becomes BIG, the choice of algorithm becomes Paramount. Cloud computing and multicore processors makes the algorithms ability to be parallelised more important than ever.

Course content

At the end of the course the students:

- Have experience with a representative selection of algorithms and data structures

- Knows what's inside the abstract data types of programming framework

- Knows how compare algorithms and data structures' time complexity

- Knows how to use algorithms on big data.

At the end of the course the students can:

- Use relevant algorithms in own applications

- Calculate time and space complexity (big O) of an algorithm or data structure

- Handle big and faulty data

The students will make solutions for five major assignments and three minor assignments. The student will choose one major assignment solution as basis for the exam. Further more a questionaire will be given in the end of the course. The result of the questionaire will be a part of the exam.

Exam

The exam is oral but as part of the exam a written test is performed in the end of the course. For the oral part, the student will prepare a (app. ten minutes) presentation of the solution of one of the major assignments. Further discussions will be based on the presentation, but can include all aspects of the curriculum.

Admission requisite

In order to be approved for the exam:

- All five major assignments must be handed in

- Attendance at the questionare

- At least 80 study points must be obtained

Study points

- Attendance: 20

- Hand in of major assignments (8 per assignment): 40

- Hand in of minor assignments (4 per assignment): 12

- Attendance at the questionaire: 28