



Course syllabus

Faculty Board of Science and Engineering

School of Computer Science, Physics and Mathematics

1DV413 Datastrukturer och algoritmer för realtidsgrafik, 7,5 högskolepoäng

1DV413 Data Structures and Algorithms for Real Time Graphics, 7.5 credits

Main field of study

Computer Science

Subject Group

Informatics/Computer and Systems Sciences

Level of classification

First Level

Progression

G2F

Date of Ratification

Approved by School of Computer Science, Physics and Mathematics 2011-01-17

The course syllabus is valid from spring semester 2011

Prerequisites

Object Oriented Analysis and Design using UML 7.5 credits (1DV407), Introduction to Game Programming 7.5 credits (1DV437), and Shader Programming 7.5 credits (1DV438) or equivalent.

Objectives

The goal of the course is to give the student insight into the data structures and algorithms that are used to represent and process the three-dimensional graphics to be visualized in real time. After this course the student will be able to:

- understand and use spatially arranged objects hierarchies
- reduce the level of detail in polygon structures
- understand and use spatial subdivision techniques.

Content

The course covers:

- Introduction to real time graphics.
- Introduction to datastructures and algorithms.

- The use of geometric primitives such as planes, lines, boxes and spheres.
- Construction of scene graphs and culling of objects using bounding volumes.
- Techniques for representing and detail reducing height fields.
- Static and dynamic detail reduction polygonstructures.
- Construction of binary space partitioning trees, quad trees and octagon trees.

Type of Instruction

Teaching is conducted using lectures, exercises, and laboratory experiments.

Examination

The course is assessed with the grades U, 3, 4 or 5.

On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

Grades are given after the completion of the course and based on results on the exam and quality of submitted laboratory experiments. The minimum requirements to receive a final grade is grade 3 on the exam, grade 3 in the laboratory assignments, and passing grades on all required elements.

Course Evaluation

A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

Required Reading and Additional Study Material

Required Reading

Daniel Sánchez-Crespo Dalmau, *Core Techniques and algorithms in Game Programming*, New Riders (2004), ISBN: 0131020099
Laborationspm, Linnæus University
 Course website

Reference literature

Tomas Akenine-Moller, Eric Haines, *Real Time Rendering (2nd Edition)*, AK Peters (2007), ISBN: 1568811829