Modelling and Animation

Programme course

6 credits

Modellering och animering

TNM079

Valid from: 2017 Spring semester

Determined by

Board of Studies for Computer Science
and Media Technology

Date determined

2017-01-25

Main field of study

Computer Science and Engineering, Media Technology and Engineering

Course level

Second cycle

Advancement level

A1X

Course offered for

- Computer Science and Engineering, M Sc in Engineering
- Media Technology and Engineering, M Sc in Engineering
- Applied Physics and Electrical Engineering, M Sc in Engineering
- Information Technology, M Sc in Engineering
- Applied Physics and Electrical Engineering - International, M Sc in Engineering
- Computer Science and Software Engineering, M Sc in Engineering
- Computer Science, Master's programme

Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites

Computer Graphics, Linear Algebra, Calculus in several variables, Programming

Intended learning outcomes

The aim of the course is to give the students knowledge of current and advanced methods in computer graphics for modeling and animation of virtual objects. After completing the course the student shall be able to:

- understand and evaluate different mathematical representations of surfaces in 3D
- describe and implement alternative data structures and decimation methods for polygon meshes
- describe and implement 3D models using subdivision surfaces and implicitly defined surfaces
- understand the principles and methods of modelling using level-sets
- describe and implement the principles and methods used in simulation and animation of fluids

Course content

Representations of surfaces in 3D. Triangular meshes in modeling. Mesh decimation. Implicit modeling. The level-set method in computer graphics and modeling. Splines and subdivision surfaces. Physics based simulation and animation of fluids.

Teaching and working methods

The course starts with a series of lectures, providing an overview and presenting the theory in the field. The lecture material is accompanied by a set of laboratory exercises to demonstrate the theory in action. At the end of the course a written exam is given. To complete the course, students must have passed the lab exercises and the written exam. Grades are based both on the lab exercises and the written exam.

Examination

LAB4	Laboratory work	4 credits	U, 3, 4, 5
TEN3	Written examination	2 credits	U, 3, 4, 5

Grades

Four-grade scale, LiU, U, 3, 4, 5

Department

Institutionen för teknik och naturvetenskap

Director of Studies or equivalent

Camilla Forsell

Examiner

Mark E Dieckmann

Education components

Preliminary scheduled hours: 48 h
Recommended self-study hours: 112 h

Course literature

Föreläsningsanteckningar och material inför varje praktisk uppgift utgör basen för kurslitteraturen. Därtill refereras relevanta forskningsartiklar inom området. Sådant kompletterande material ges ut av institutionen.

LiU
LINKÖPINGS UNIVERSITET

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.