CM2004 Medicinsk visualisering 7.5 credits

Medicinsk visualisering

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for CM2004 valid from Autumn 2019

Grading scale

P, F

Education cycle

Second cycle

Main field of study

Medical Engineering

Specific prerequisites

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

Medical image visualization is a specific area of scientific visualization that is focused on medical applications. Visualization in a medical context is used for different purposes, including diagnosis with radiological data, treatment planning, intraoperative support, data annotation and educational purposes among others.

This course covers the concepts, theories and most used methods used for exploring and interacting with images in medical applications. After completion, the participant will be able to:

- Understand the different parts of a visualization pipeline
- Understand the theory of the most used methods for surface and volume rendering
- Summarize the most used techniques in volume interaction and stereo rendering
- Design visualization solutions for medical applications
- Select and adapt the most appropriate methods for image visualization in medical applications
- Create visualization prototypes using medical images that can be used in medical applications

in order to:

- understand the complete visualization pipeline in a medical context
- be able to implement visualization solutions in medical applications
- have a broad knowledge base that can ease understanding literature in the field

Course contents

- Applications in medical image visualization
- The visualization pipeline
- Surface reconstruction and rendering
- Volume rendering
- Volume interaction
- Stereoscopic techniques

The course consists of lectures, laboratories and mathematical exercises. The participants will combine VTK (the Visualization Toolkit) in Python with other libraries. The course also includes introductory labs for students with programming experience but without experience in Python.

Examination

- PRO1 - Project, 7.5 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Approved project assignment and participation in at least 90% of the course activities.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.