LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Högpresterande datorgrafik
High Performance Computer Graphics

EDAN35, 7,5 credits, A (Second Cycle)

Valid for: 2023/24
Faculty: Faculty of Engineering, LTH
Decided by: PLED C/D
Date of Decision: 2023-04-18

General Information

Main field: Virtual Reality and Augmented Reality.
Compulsory for: MVAR1
Elective for: C4, D4-bg, E4-bg, F4, F4-bg, L5-gi, Pi4
Language of instruction: The course will be given in English

Aim

The purpose of the course is to that the students shall comprehend the foundations about three-dimensional computer graphics using hardware accelerators. Furthermore, the student shall understand how graphics algorithms for hardware work, and the student shall be able to apply this in practice.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- be able to analyze graphics architectures, and also be able to set up hypotheses about what a new algorithm can give in terms of improvements.
- be able to describe graphics architectures.
- have an insight into the current state of the art APIs for graphic

Competences and skills
For a passing grade the student must

- be able to implement three-dimensional applications on hardware accelerators using existing APIs.
- be able to design, develop and use software to implement algorithms intended for

graphics hardware
- be able to evaluate and be able to value graphics architectures, i.e., study theoretical issues.
- be able to orally describe the assignments.

Judgement and approach
For a passing grade the student must

- be able to find information about algorithms, and critically value these, and thereafter implement, and test whether a good result can be obtained.

Contents

Graphics architectures, shader programming, graphics APIs, edge functions, perspectively correct interpolation, texturing, caching, filtering, fixed-point math, texture compression, performance analysis, antialiasing algorithms and culling algorithms.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: Written examination and completed course assignments. To qualify for the written examination students must have completed the assignments. The final grade of the course is based on the result of the written examination (50%), labs (20%) and project (30%).

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts
Code: 0114. **Name:** Written Examination.
Credits: 4. **Grading scale:** TH. **Assessment:** To qualify for the exam the compulsory course items must be completed. The final grade of the course is based on the result of the written examination, the labs and the project. **Contents:** Written examination.
Code: 0214. **Name:** Project.
Credits: 2. **Grading scale:** TH. **Assessment:** To qualify for a passing grade the project work must be completed.
Code: 0314. **Name:** Laboratory Work.
Credits: 1,5. **Grading scale:** UG. **Assessment:** To qualify for a passing grade the laboratory work must be completed. **Contents:** Laboratory work

Admission

Admission requirements:

- Completed compulsory course items from EDAF80 Computer Graphics

The number of participants is limited to: No
The course overlaps following course/s: EDA075

Reading list

- Published papers from the leading researchers in the field.

Contact and other information

Course coordinator: Michael Doggett, Michael.Doggett@cs.lth.se
Course homepage: http://cs.lth.se/edan35