Course syllabus

**Datorseende**

**Computer Vision**

**FMAN85, 6 credits, A (Second Cycle)**

Valid for: 2019/20  
Decided by: PLED F/Pi  
Date of Decision: 2019-03-26

**General Information**

Elective for: BME4, C4, D4-bg, D4-mai, E4-bg, F4, F4-bg, F4-mai, Pi4-bam  
Language of instruction: The course will be given in English on demand

**Aim**

The aim of the course is to give an overview of the theory of and practically useful methods in computer vision, with applications within e.g. vision systems, non-invasive measurements and augmented reality. In addition the aim is to make the student develop his or her ability in problem solving, with and without a computer, using mathematical tools taken from many areas of the mathematical sciences, in particular geometry, optimization, mathematical statistics, invariant theory and transform theory.

**Learning outcomes**

**Knowledge and understanding**

For a passing grade the student must

- be able to clearly explain and use basic concepts in computer vision, in particular regarding projective geometry, camera modelling, stereo vision, recognition, and structure and motion problems.
- be able to describe and give an informal explanation of the mathematical theory behind some central algorithms in computer vision (the least squares method and Newton based optimization).

**Competences and skills**

For a passing grade the student must
in an engineering manner be able to use computer packages to independently solve problems in computer vision.

- be able to show good ability to independently identify problems which can be solved with methods from computer vision, and be able to choose an appropriate method.
- be able to independently apply basic methods in computer vision to problems which are relevant in industrial applications or research.
- with proper terminology, in a well-structured way and with clear logic, be able to explain the solution to a problem in computer vision.

Contents


Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: Compulsory assignments comprising both theory and computer work. Approved results on all these is enough to pass the course. To get a higher grade it is necessary to pass a written and an oral test

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.

Admission

Required prior knowledge: FMAF05 Systems and Transforms, or equivalent (for example FMAF10).
The number of participants is limited to: No
The course overlaps following course/s: FMA270, FMA271

Reading list


Contact and other information

Course coordinator: Studierektor Anders Holst, Studierektor@math.lth.se
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