



Computerized Image Processing and Machine Vision 7.5 cr

Digital bildbehandling och datorseende 7,5 hp

Set by Faculty of Engineering and Sustainable Development

Version

Set at

Valid from

2/26/18

HT2018

Level	A1F
Education level	Second cycle
Course identifier	EEA308
Credits	7.5 cr
Main field of study	Electronics, Computer Science
Subject group	Electronics
Disciplinary domain	Technology 100.0 %

Learning outcomes

After completion of the course the student shall be able to

1. identify and explain fundamental concepts, methods and techniques in the field of computerized image processing, image analysis, computer vision, as well as human vision
2. identify and analyze complex problem settings related to computer vision & image analysis
3. conceptually design a solution by proposing adequate methods for acquisition, analysis and classification of images in a chosen application
4. implement an image analysis/computer vision system based on own design and to systematically evaluate it according to relevant assessment criteria
5. analyze and present in writing the process of identifying and solving a technical problem in image analysis/computer vision, as well as to critically discuss results and conclusions based on own systematic evaluations.

Course content

Overview of goals, methods and limitations of computerized image analysis and computer vision

Introduction to digital imaging modalities, image formation process and digital image representation

Biological vision and the human visual perception

Fundamental concepts and methods in image analysis: signal theory, filtering, image enhancement, image reconstruction, morphological operations, and image segmentation

Fundamental concepts in and methods in computer vision: multi-level representations, higher level feature detection and classification (edges, corners, and others) and object recognition
 Stereo and multiview computer vision
 Image registration and projective transforms.

Teaching Teaching comprises lectures, laboratory exercises, and assignments. For the assignments emphasis is put on the student's ability to experimentally evaluate image analysis/computer vision for a chosen problem area and to critically discuss own findings. Lectures are not mandatory for the students.

Prerequisites Statistical Signal Processing 7.5 cr and Algorithms and Data structures 7.5 cr or equivalent.

Examination Written examination, project and laboratory work

Module 0010 Written examination examines Learning outcomes 1-2
 Module 0020 Project examines Learning outcomes 3-4
 Module 0030 Laboratory work examines Learning outcome 5

Grade A, B, C, D, E, Fx, F

Other regulations Criteria for final grade will be given at the beginning of the course.

Sustainable environment A minor part of the course content deals with sustainable development.

Module			
	0010	Written examination	2.5 cr Grade: AF
	0020	Project	2 cr Grade: AF
	0030	Laboratory work	3 cr Grade: UG