



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Introduction to object and event recognition

Course

Field of study

Electronics and Telecommunications

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/Sem. 6

Profile of study

general academic

Course offered in

english

Requirements

elective

Number of hours

Lecture

15

Tutorials

Laboratory classes

15

Projects/seminars

Other (e.g. online)

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr inż. Sławomir Maćkowiak

Responsible for the course/lecturer:

Prerequisites

Has knowledge of programming in C / C + +. Has basic knowledge in the field of image processing. Is able to look for information required during educational process and take educational courses, if needed, especially through Internet and distance education. Capable of self-learning (books, computer programs)He acts actively in class, asks questions, knowingly uses the contact with the teacher (eg. consultation



Course objective

Understanding of basic concepts in video object recognition, focus is put on the methods of data analysis. Removing the noisy, distortion, filtering the image, object segmentation, classification, basic techniques for detection and tracking.

Course-related learning outcomes

Knowledge

It has a structured, mathematical underpinnings of knowledge, video acquisition, human perception, quality assessment, processing, digital representation, compression and transmission of video signals, speech and audio for use in multimedia systems. It has a basic knowledge on developments in matters relating to the processing and image processing. He has knowledge in the field of non-linear processing of multimedia content, image reconstruction and restaurants, technology acquisition and presentation of stereoscopic images.

Skills

He understands the technical conditions for the transmission, storage and presentation of multimedia data and can make appropriate basic requirements for technical systems implementing multimedia services. Can define the requirements for the system that performs the basic tasks associated with multimedia. Has the ability to analyze media content, in particular the detection and classification of objects. Understand the basic provisions of the relevant international standards.

Social competences

Is open to the possibility of continuous training and understands the need to improve professional competence

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired as part of the lecture is verified during the exam. The exam takes the form of a written and / or oral exam. The exam is a collection of several open questions with different levels of difficulty with the assigned number of points. The exam is passed when the number of points scored exceeds 50%.

Completion of the laboratory is based on the current assessment of student progress during the implementation of tasks defined as a result of laboratory instructions and / or the results of assumptions from the discussion at the beginning of the class.

Rating scale: <= 50% 2.0; 51% -60% 3.0; 61% -70% 3.5; 71% -80% 4.0; 81% -90% 4.5; 91% -100% 5.0

Programme content

Lecture: Analysis of the content of the images. Removing the noisy images, distortion artifacts. Filtering the image, edge detection, segmentation of objects (methods of solving area), classification of data (linear and nonlinear methods, LDA, PCA, neural networks), basic techniques for object detection and tracking of moving objects. Methods HOG, SURF, SIFT. Expanding knowledge of stereoscopy, 3D video



systems, advanced compression techniques. Treatment of non-linear multimedia content, image reconstruction and restaurant, technology acquisition and presentation of stereoscopic images.

Laboratory: Analysis of the content of the images. Removing the noisy images, distortion artifacts. Filtering the image, edge detection, segmentation of objects

Teaching methods

Traditional lecture

Laboratory - in the early phase of the discussion, then individual / or group work method implementation of the project.

Bibliography

Basic

1. Computer vision : algorithms and applications / Richard Szeliski. Autor: Szeliski, Richard (1958-). Springer-Verlag, cop. 2011.

2. Algorithms for image processing and computer vision / J. R. Parker. Autor: Parker, Jim R. (1955-). Wiley Computer Publishing, cop. 1997

Additional

1. Dr Simon J. D. Prince, Computer Vision: Models, Learning, and Inference, Cambridge University Press; 1 edition (June 18, 2012)

2. Jens R. Ohm, Multimedia Communication Technology, Springer 2004

3. Nillson, Intelligent Network Video: Understanding Modern Video Surveillance Systems, CRC Press; Har/Dvdr edition (September 10, 2008)

4. ISO/IEC IS 13818-1 / ITU-T Rec. H.262: Information technology ? Generic coding of moving pictures and associated audio information. Part 1: Systems, 1997

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	31	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	44	1,0

¹ delete or add other activities as appropriate