# COURSE DESCRIPTION CARD - SYLLABUS

Course name
Introduction to Object and Event Recognition [S1EiT1E>WdROiZ]

## Course

Field of study
Electronics and Telecommunications

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
english

Form of study
full-time

Requirements
elective

## Number of hours

Lecture
15

Laboratory classes
15

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

## Number of credit points
3,00

## Coordinators

dr inż. Sławomir Maćkowiak
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## Lecturers

## 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:

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 | 0 | 0,00 |
| Classes requiring direct contact with the teacher | 0 | 0,00 |
| Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation) | 0 | 0,00 |