



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Networked surveillance systems

Course

Field of study

Electronics and Telecommunications

Area of study (specialization)

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

2/Sem. 3

Profile of study

general academic

Course offered in

english

Requirements

elective

Number of hours

Lecture

30

Laboratory classes

15

Other (e.g. online)

Tutorials

15

Projects/seminars

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

dr inż. Sławomir Maćkowiak

Responsible for the course/lecturer:

slawomir.mackowiak@put.poznan.pl

Prerequisites

Has knowledge of programming in C / C ++ / Matlab. 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

The course meets the latest trends in the industrial use of modern multimedia technologies in telecommunications systems for the identification of persons or property, access control and supervision over separated zones and persons.

Course-related learning outcomes

Knowledge

Has practical knowledge of systems for ensuring the safety of persons and property. Has practical knowledge of the principles of designing CCTV systems.

Skills

Has the ability to construct CCTV systems that perform basic functions: recording of video materials, videoprocessing, automatic analysis of contents, giving the user a number of selected information necessary to maintain the required level of security of areas and objects to be secured.

Social competences

Is open to the possibility of continuous training and understands the need to improve professional competence. Has a sense of responsibility for designed electronic and telecommunications systems.

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: Improving image quality (noise reduction, restaurant image). Traffic analysis (motion estimation, optical flow method). Automatic segmentation of video sequences. Infrared surveillance video (emissivity, thermal image analysis, bolometric arrays, practical performance measurement, thermal equipment). Intelligent video surveillance systems - algorithms (detection of moving objects detection, missing object, object counting, identifying abnormal behavior of objects, synopsis video). Design of CCTV systems for public facilities (public places). Hardware implementation (cameras, wired and wireless networks, routers, recorders).



Laboratory: Analysis of the content of the images. Removing noise and distortion artifacts. Filtering the image, edge detection. Foreground object detection. Motion detection. Heat map. IP video networked hardware.

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	100	4,0
Classes requiring direct contact with the teacher	70	3,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam) ¹	30	1,0

¹ delete or add other activities as appropriate