COURSE DESCRIPTION CARD - SYLLABUS

Course name
Introduction to visual data analysis

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

Subject concerns about the recording equipment (camera or multiple cameras), devices for data acquisition and processing (such as a frame grabber) and data analysis equipment. When test subjects are off, an integral part of the machine vision systems are a source of light, the illuminators. Machine vision systems for quality - check the physical characteristics of objects, such as size, shape, color, surface, (gloss, roughness, printing, etc.).Industrial Vision, Automatic Video Analysis of the environment on the similarity of the visual modality in humans.

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 the field of electronics and telecommunications. 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. Understand the basic provisions of the relevant international standards. 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. Video Converters and improve image quality (restaurant image, removing noise on images, distortion artifacts). Expanding knowledge of advanced techniques of

compression (AVC HEVC). Treatment of nonlinear multimedia content, image reconstruction and restaurant. Infrared (emissivity, the analysis of thermal images, bolometric arrays, practical performance measurement, thermal imaging devices). Equipment and technology acquisition, recording and presentation of 2D and 3D (including stereoscopic images).

Laboratory: Analysis of the content of the images. Removing the noisy images, distortion artifacts. Filtering the image, edge detection, recording and presentation of 2D and 3D (including stereoscopic images).

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