COURSE DESCRIPTION CARD - SYLLABUS

Course name
Introduction to computer vision

Course

Field of study
Control and Robotics

Year/Semester
3/5

Area of study (specialization)
-

Profile of study
practical

Level of study
First-cycle studies

Course offered in
polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
30

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
dr inż. Marek Kraft
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Wydział Automatyki, Robotyki i Elektrotechniki
Poznań, Piotrowo 3A

Responsible for the course/lecturer:

Prerequisites

Knowledge: The student should have general, undergradate-level knowledge on mathematics - algebra, mathematical analysis, logic and probabilistics.
Skills: The student should be able to use the personal computer efficiently and be capable of implementing simple algorithms and progrmming assignments. The skill of acquiring knowledge from indicated sources is also required.

Course objective

The aim of the course is for students with basic issues in the functioning of vision and image processing systems and their application in automation and robotics applications.

Course-related learning outcomes

Knowledge

Skills

Social competences

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:
Lecture - final credit test carried out on Moodle plaftorm.
Laboratories - project and final practical programming test.

Programme content

Image acquisition, image encoding methods, basic video encoding.
Using the OpenCV library for image processing.
Processing based on colors and histograms.
Pre-processing of the image - local methods (gamma correction, histogram-based processing, thresholding, etc.).
Contextual methods - convolution, linear and non-linear filtration; morphological operations.
Detection of image features (lines, points).
Image feature descriptors.
Segmentation and analysis of shapes.
The role of lighting in vision systems.
Industrial vision systems.

Teaching methods

Lectures with multimedia presentations, additionally placed in the streaming service to be played later.
Laboratory classes covering the implementation and testing of selected algorithms of image and video processing using Python language and solving selected practical problems.

Bibliography

Basic

1. R. Szeliski, Computer Vision: Algorithms and Applications, Springer, 2010
2. Supplementary material published on Moodle

Additional

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Breakdown of average student's workload

	Hours	ECTS
Total workload	90	3,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	45	1,0

[1] delete or add other activities as appropriate