SYLLABUS OF A MODULE

Polish name of a module	**Rozpoznawanie obrazu, rozpoznawanie wzorców i wyszukiwanie obrazów**
English name of a module	Computer vision, pattern recognition & Image retrieval
ISCED classification - Code	0619
ISCED classification - Field of study	*Information and Communication Technologies (ICTs), not elsewhere classified*
Languages of instruction	*English*
Level of qualification:	*2*
Number of ECTS credit points	*4*
Examination:	*A*
Available in semester:	*A*

Number of hours per semester:

Lecture	Tutorial	Laboratory	Seminar	Project	Others
15	0	45	0	0	0

MODULE DESCRIPTION

Module objectives

O1. To acquaint students with the basic methods and techniques of digital imaging and digital video signals using the knowledge of the theory of signals and digital technology.

O2. Acquisition by students practical skills in recording, coding, compress, convert, filtering, analysis, processing, recognition and retrieval of video signals implemented for systems using image information.

PRELIMINARY REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge of mathematics, digital technology and the basics of programming.
2. Ability to perform mathematical operations to solve given tasks related to the theory of signals.

LEARNING OUTCOMES

LO 1 - student has a basic theoretical knowledge in digital signal processing and analysis of static images and video signals,

LO 2 - student knows the trends computer vision and image retrieval

LO 3 - student is able to offer the type of filtration in order to solve a specific issue related to the analysis and processing of digital images,

LO 4 - student is able to perform detection and recognition of selected elements in images.

MODULE CONTENT

Type of classes – Lectures		**Number of hours**
Lect. 1	Introduction to mage analysis and processing, color structure of digital images	**1**
Lect. 2	Geometric transformations	**1**
Lect. 3	Linear filtering	**1**
Lect. 4	Nonlinear filtering and morphology operations	**1**
Lect. 5	Fourier transforms, pyramids and wavelets	**1**
Lect. 6	Feature detection	**1**
Lect. 7	Segmentation	**1**
Lect. 8	Pattern recognition	**1**
Lect. 9	Dimensionality reduction	**1**
Lect. 10	Object detection	**1**
Lect. 11	Image retrieval	**1**
Lect. 12	Convolutional Neural Networks	**1**

Lect. 13	Structure form motion, shape from shading and photometric stereo	**1**
Lect. 14	3D face recognition	**1**
Lect. 15	Image understanding	**1**
Type of classes– Laboratory		**Number of hours**
Lab. 1	Introduction to mage analysis and processing, color structure of digital images	**3**
Lab. 2	Geometric transformations	**3**
Lab. 3	Linear filtering	**3**
Lab. 4	Nonlinear filtering and morphology operations	**3**
Lab. 5	Fourier transforms, pyramids and wavelets	**3**
Lab. 6	Feature detection	**3**
Lab. 7	Segmentation	**3**
Lab. 8	Pattern recognition	**3**
Lab. 9	Dimensionality reduction	**3**
Lab. 10	Object detection	**3**
Lab. 11	Image retrieval	**3**
Lab. 12	Convolutional Neural Networks	**3**
Lab. 13	Structure form motion, shape from shading and photometric stereo	**3**
Lab. 14	3D face recognition	**3**
Lab. 15	Image understanding	**3**

TEACHING TOOLS

1. – lecture using multimedia presentations
2. – preparation of laboratory reports

WAYS OF ASSESSMENT (F – FORMATIVE, S – SUMMATIVE

F1. – assessment of reports
F2. – assessment of activity and control tests (optional)

S1. – assessment of the project (optional)
S2. – assessment of knowledge

*) warunkiem uzyskania zaliczenia jest otrzymanie pozytywnych ocen ze wszystkich ćwiczeń laboratoryjnych oraz realizacji zadania sprawdzającego

STUDENT'S WORKLOAD

L.p.	**Forms of activity**	**Average number of hours required for realization of activity**
1. Contact hours with teacher		
1.1	Lectures	15
1.2	Tutorials	0
1.3	Laboratory	45
1.4	Seminar	0
1.5	Project	0
Total number of contact hours with teacher:		60
2. Student's individual work		
2.1	Preparation for tutorials and tests	0
2.2	Prreparation for laboratory exercises, writing reports on laboratories	10
2.3	Preparation of project	11
2.4	Preparation for final lecture assessment	9
2.5	Preparation for examination	0
2.6	Individual study of literature	10
Total numer of hours of student's individual work:		40
Overall student's workload:		100
Overall number of **ECTS** credits for the module		4
Number of **ECTS** points that student receives in classes		2,4

requiring teacher's supervision:	
Number of **ECTS** credits acquired during practical classes including laboratory exercises and projects :	1,8

BASIC AND SUPPLEMENTARY RESOURCE MATERIALS

1. Richard Szeliski, Computer Vision: Algorithms and Applications, Springer 2011
2. Mubarak Shah, Fundamentals of Computer Vision, Orlando: University of Central Florida 1997.
3. http://www.mathworks.com/

MODULE COORDINATOR (NAME, SURNAME, INSTITUTE, E-MAIL ADDRESS)

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