



## Subject card

Subject name and code	Image Processing in Robotics, PG_00047513						
Field of study	Automatic Control, Cybernetics and Robotics						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			English		
Semester of study	2	ECTS credits			1.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Decision Systems and Robotics -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		mgr inż. Sebastian Dziejewicz				
	Teachers		mgr inż. Sebastian Dziejewicz				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	15		2.0		8.0	25
Subject objectives	The participants should learn about the process of image acquisition from a video camera, all the problems connected with a proper image acquisition for image processing. Students should know the algorithms of image transformation, filtration, feature detection (image descriptors) and image processing algorithms used in industrial robotic systems.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W01] Knows and understands, to an increased extent, mathematics to the extent necessary to formulate and solve complex issues related to the field of study.		Student knows and understands the mathematical foundations of image processing algorithms used in robotics.		[SW1] Assessment of factual knowledge		
	[K7_W03] Knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum.		Student understands the principles of operation of image processing systems in robotics.		[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
[K7_K02] is ready to provide critical evaluation of received content and to acknowledge the importance of knowledge in solving cognitive and practical problems		Student is able to critically assess the methods and algorithms used in image processing in practical engineering issues.		[SK4] Assessment of communication skills, including language correctness [SK3] Assessment of ability to organize work			
Subject contents	The content of the subject includes problems of video image perception and acquisition, recording and methods of image processing for robotic applications. Processing concerns stereovision images as well as single image. The prospects of applying processing algorithms are discussed for industrial and mobile robots.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Exam		50.0%		100.0%		

Recommended reading	Basic literature	Davies E.R. (2012), <i>Computer and Machine Vision: Theory, Algorithms, Practicalities</i> , Elsevier 2005
	Supplementary literature	Gonzalez R. C. Woods R. E., <i>Digital Image Processing (3rd Edition)</i> , Prentice Hall 2008
	eResources addresses	Adresy na platformie eNauczanie: Image Processing in Robotics - Moodle ID: 34087 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34087">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34087</a>
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	