GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Digital Photogrametry, PG_00048301		
Field of study	Informatics		
Date of commencement of studies	February 2024	Academic year of realisation of subject	2024/2025
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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Geoinformatics -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Marcin Ciecholewski	
	Teachers	dr hab. Marcin Ciecholewski	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30	6.0	39.0	75

Subject objectives	The aim of the course is to familiarize students with the subject of digital photogrammetry. The main emphasis is on the use of information technology in digital photogrammetry.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U07] can apply advanced methods of process and function support, specific to the field of study	The student is able to use advanced libraries during the development of proprietary software.	[SU4] Assessment of ability to use methods and tools
[K7_W05] Knows and understands, to an increased extent, methods of process and function support, specific to the field of study.	The student knows the ways to automate photogrammetry processing.	[SW3] Assessment of knowledge contained in written work and projects
[K7_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, making assessment and critical analysis of the prepared software as well as a synthesis and creative interpretation of information presented with it	Student is able to apply photogrammetric models and techniques during the development of proprietary software.	[SU1] Assessment of task fulfilment
[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.	The student knows the camera models used in photogrammetry. The student knows stereoscopic vision models and ways of representing them, such as the fundamental matrix.	[SW1] Assessment of factual knowledge

Subject contents

Introduction to digital photogrammetry

Overview of photogrammetric technology

Photogrammetric products: digital terrain model, orthophotomap

Sources of data in photogrammetry

The geometry of the single-image - pinhole camera calibration

Principles of stereoscopic vision and stereoscopic observation. The geometry of the photogrammetric stereo pair - fundamental matrix

Correlation of images and automation of measurement - detectors and descriptors SIFT

Estimation of homogrphy, fundamental matrix, aerial triangulation - RANSAC method

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Oral colloquium	50.0%	50.0%
Collection of laboratory tasks	50.0%	50.0%

Recommended reading

Basic literature	1. Krzysztof Bruniecki; Materiały do wykładu z Fotogrametrii Cyfrowej; Online; 2014 2. S. Przewłocki: Geodezja dla kierunków niegeodezyjnych. PWN, Warszawa, 2006 3. Z. Kurczyński: Lotnicze i satelitarne obrazowanie Ziemi. Oficyna Wydawnicza Politechniki Warszaw-skiej, Warszawa 2006 4. Z. Kurczyński, Ryszard Preuss: Podstawy fotogrametrii. Oficyna Wydawnicza Politechniki Warszaw-skiej, Warszawa 2003
Supplementary literature	Richard Hartley; Andrew Zisserman; Multiple View Geometry in Computer Vision; Cambridge University Press, 2004
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

camera calibration

Estimation of the fundamental matrix

Algorithm of 8-point correspondence

RANSAC algorithm

3D visualization of photogrammetric products

Work placement

Not applicable