

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Basics of deep learning, PG_00063889								
Field of study	Informatics								
Date of commencement of studies	October 2024		Academic year of realisation of subject			2026/2027			
Education level	first-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	3		Language of instruction			Polish			
Semester of study	5		ECTS credits			2.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Department of Comp	of Computer Architecture -> Faculty of Electronics, Telecommunications and Informatics					matics		
Name and surname	Subject supervisor		dr inż. Jan Cychnerski						
of lecturer (lecturers)	Teachers		mgr inż. Karol Draszawka						
Lesson types and methods	Lesson type	Lecture	Tutorial	aboratory Project		t	Seminar	SUM	
of instruction	Number of study hours	15.0	0.0	0.0 15.0			0.0	30	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity	Participation ir classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM	
	Number of study hours	30		2.0		18.0		50	
Subject objectives	Introduction to theory	and practice of	f deep learning						
Learning outcomes	Course outcome Subject outcome Method of verification								
	[K6_W11] knows and understands to an advanced degree the general principles of the creation and development of economic entities, forms of individual entrepreneurship and conducting enterprises and the fundamental dilemmas of modern civilization, as well as the basic economic, legal and other conditions of various types of activities related to the field of study, including the basic concepts and principles of industrial property protection and copyright law		A student knows the basics of systems based on deep neural networks, the core of most modern artificial intelligence systems.			[SW1] Assessment of factual knowledge			
	[K6_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment [K6_U11] can plan and organise individual and tags		Based on the analysis of the problem, the available training data, a student is able to select the appropriate architecture of a deep neural network and the training algorithm of this model to solve the problem. He/She can determine the quality of the prepared system.			[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment [SU1] Assessment of task fulfilment			
	individual and team work		 performs an indivdual assignment takes part in a group assignment 			Itulfilment			
Subject contents	 Fundamentals of supervised machine learning Fundamentals of artificial neural networks - basic models, layers, training algorithms Convolutional neural networks Recurrent neural networks Transformer-like neural networks Methods of regularization of neural networks Practical tips for projects using deep neural networks 								

Prerequisites					
and co-requisites					
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade		
	Practical exercise	50.0%	50.0%		
	Midterm colloquium	50.0%	50.0%		
Recommended reading	Basic literature	Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016 Michael Nielsen, Neural Networks and Deep Learning			
	Supplementary literature	Andrew Ng, Machine Learning Yearning Tutorials on deep learning frameworks (e.g. PyTorch, Keras)			
	eResources addresses	Podstawowe http://neuralnetworksanddeeplearning.com/ - http:// neuralnetworksanddeeplearning.com/ http://www.deeplearningbook.org/ - http://www.deeplearningbook.org/ Uzupełniające Adresy na platformie eNauczanie:			
Example issues/ example questions/ tasks being completed	 Describe the architecture of convolutional neural networks, indicate their advantages over MLP networks and their typical applications. During the development of a project using deep model learning, the developer observed a low training error, but high validation error. What could be the reason for this? Consider several scenarios. Suggest ways to improve. 				
Work placement	Not applicable				

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