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 2025	Academic year of realisation of subject	2027/2028
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 Computer Architecture -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej

Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Jan Cychnerski
	Teachers	mgr inż. Karol Draszawka

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
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 in didactic classes included in study plan	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 deep learning.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U11] can plan and organise individual and team work	Student: - performs an indivdual assignment - takes part in a group assignment	[SU1] Assessment of task fulfilment
[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	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.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools

Subject contents	1. Fundamentals of supervised machine learning 2. Fundamentals of artificial neural networks - basic models, layers, training algorithms 3. Convolutional neural networks 4. Recurrent neural networks 5. Transformer-like neural networks 6. Methods of regularization of neural networks 7. 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
Midterm colloquium	50.0%	50.0%
Practical exercise	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	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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