

关。GDAŃSK UNIVERSITY 多 OF TECHNOLOGY

Subject card

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hours The aim of the course field of Machine Lean			10.0				
field of Machine Learn	e is to introduce		10.0		35.0		75
The aim of the course is to introduce students to a comprehensive knowledge of the dynamically developing field of Machine Learning and to indicate its practical applications in widely understood automation and computer science.							
Course outcome		Subject outcome		Method of verification			
K7_U04							
K7_U03							
		Students will be able to apply		ISI 141 Assossment of ability to			
		known artificial intelligence tools and algorithms to solve research problems e.g. to design a neural classifier.		ools arch	use methods and tools		
K7_W11		The student in a small team is able to design, prepare and carry out an experiment, and then draw appropriate conclusions. For example, he/she is able to prepare a diagnostic system, which allows to identify damage to a selected system.		[SW3] Assessment of knowledge contained in written work and projects			
exploratory research- data normalization,- n regression models, - networks, - learning: s random forests- ense performance analysis techniques,- model va	data grouping, nultidimensiona Support vector supervised, uns mbling and gra and improvem alidation,- select	lised in three th , clustering - fea al data visualization machines, - Ne supervised, ser adient boosting hent, including- ction of hyperpa	ature selection ation. 2. Models eural networks, mi-supervised, methods- auto quality measu	and ext s and m - recurr reinforce matic m res of m	raction, ethods rent neu ement l achine odel pe	, - dimension of their learn ural networks learning- dec learning (Aut erformance, -	reduction, - ing, e.g:- s,- deep neural ision trees- toML)3. Model regularization
	Course out K7_U04 K7_U03 K7_W08 K7_W06 K7_U07 K7_U07 K7_W11 The programme content exploratory research- data normalization,- r regression models, - networks, - learning:: random forests- ense performance analysis techniques,- model values	Course outcome K7_U04 K7_U03 K7_W08 K7_W06 K7_U07 K7_W11 The programme contents will be real exploratory research- data grouping data normalization,- multidimensionar regression models, - Support vector networks, - learning: supervised, um random forests- ensembling and graperformance analysis and improvem techniques,- model validation,- select	Course outcome Subj K7_U04 K7_U03 K7_W08 K7_W06 K7_U07 Students will I known artificia and algorithm problems e.g. classifier. K7_W11 The student ir able to design out an experint appropriate co example, he/s a diagnostic s to identify dar system. The programme contents will be realised in three th exploratory research- data grouping, clustering - fe data normalization,- multidimensional data visualiza regression models, - Support vector machines, - Ne networks, - learning: supervised, unsupervised, set random forests- ensembling and gradient boosting performance analysis and improvement, including-	Course outcome Subject outcome K7_U04 K7_U03 K7_W08 K7_W06 K7_U07 Students will be able to apply known artificial intelligence to and algorithms to solve rese problems e.g. to design a ne classifier. K7_W11 The student in a small team able to design, prepare and out an experiment, and then appropriate conclusions. For example, he/she is able to p a diagnostic system, which a to identify damage to a select system. The programme contents will be realised in three thematic blocks: exploratory research- data grouping, clustering - feature selection data normalization, - multidimensional data visualization. 2. Model regression models, - Support vector machines, - Neural networks, networks, - learning: supervised, unsupervised, semi-supervised, random forests- ensembling and gradient boosting methods- auto performance analysis and improvement, including- quality measure techniques,- model validation,- selection of hyperparameters for normalized to the substance of the	Course outcome Subject outcome K7_U04	Course outcome Subject outcome K7_U04 K7_U03 K7_W08 K7_W08 K7_W06 K7_U07 Students will be able to apply known artificial intelligence tools and algorithms to solve research problems e.g. to design a neural classifier. [SW3] K7_W11 The student in a small team is able to design, prepare and carry out an experiment, and then draw appropriate conclusions. For example, he/she is able to prepare a diagnostic system, which allows to identify damage to a selected system. [SW3] The programme contents will be realised in three thematic blocks: 1. Data analys exploratory research- data grouping, clustering - feature selection and extraction data normalization,- multidimensional data visualization. 2. Models and methods regression models, - Support vector machines, - Neural networks, - recurrent nei networks, - learning: supervised, unsupervised, semi-supervised, reinforcement random forests- ensembling and gradient boosting methods- automatic machine performance analysis and improvement, including- quality measures of model pe techniques,- model validation,- selection of hyperparameters for models,- analys	Course outcome Subject outcome Method of version K7_U04 K7_U03 K7_U03 K7_W08 K7_W06 K7_U07 Students will be able to apply known artificial intelligence tools and algorithms to solve research problems e.g. to design a neural classifier. [SU4] Assessment of the student in a small team is able to design, prepare and carry out an experiment, and then draw appropriate conclusions. For example, he/she is able to prepare a diagnostic system, which allows to identify damage to a selected system. [SW3] Assessment of the system.

Prerequisites and co-requisites	Basic knowledge of artificial intelli	gence methods and optimisation				
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade			
and criteria	Ocena projektu	50.0%	50.0%			
	Kolokwium	50.0%	50.0%			
Recommended reading	Basic literature Supplementary literature	 Bonaccorso, G. Algorytmy uczenia maszynowego. Zaawansowane techniki implementacji. Helion, 2019 Szeliga, M. Data Science i uczenie maszynowe. Wydawnictwo Naukowe PWN, 2017. Grus, J. Data science od podstaw. Analiza danych w Pythonie. Helion, 2019. Bengio, Y., Courville A., Goodfellow I. Deep Learning. Systemy uczące się. Wydawnictwo Naukowe PWN, 2018. Alpaydin, E. Introduction to Machine Learning. The MIT Press Cambridge, Massachusetts London, England 2010. Chollet, F. Deep Learning. Helion, 2019 Haykin, S. Neural Networks and Learning Machines (3rd Edition), Prentice Hall, 2009. Bishop C. M. Pattern Recognition and Machine Learning. Springer, 2006. MATLAB Statistics and Machine Learning Toolbox User's Guide, 2021. James, Gareth, et al. An introduction to statistical learning. Vol. 112. New York: springer, 2013. Murphy, Kevin P. Machine learning: a probabilistic perspective. 				
	eResources addresses	MIT press, 2012. Adresy na platformie eNauczanie:				
Example issues/ example questions/ tasks being completed	 data, dimension reduction, vis Analysis of footballers' characteries 	and knowledge extraction from large data sets, data normalisation, treatment of missing reduction, visualisation of multidimensional data. pallers' characteristics in terms of their suitability for a given team/position. malies/diagnosis of processes on the basis of multidimensional analysis of signals from ses.				
Work placement	Not applicable					