GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Artificial intelligence, PG_00058310		
Field of study	Automation, Robotics and Control Systems		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2027/2028
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study 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	4	Language of instruction	Polish
Semester of study	7	ECTS credits	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Katedra Inteligentnych Systemów Sterowania i Wspomagania Decyzji -> Faculty of Electrical and Control Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Michał Grochowski	
	Teachers		

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 aim of the course will be to familiarise Students with the current knowledge of the rapidly developing field of Artificial Intelligence and Machine Learning and to indicate its practical applications in control engineering and robotics.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W07] has basic knowledge related to control and automation systems	The student is familiar with the artificial intelligence algorithms that are used in automation and robotics.	[SW1] Assessment of factual knowledge
[K6_U09] is able to use artificial intelligence methods and understands the advantages and limitations of using this type of tools in engineering	The student proposes a specific artificial intelligence algorithm that can be used to solve a selected engineering task	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

AI and ML are rapidly gaining popularity due to, among other things, their features that allow efficient and effective information processing in conditions of large amounts of data, their uncertainty and variety. AI and ML find applications wherever the large size of data sets and their nature, make manual analysis impossible, where the system must dynamically and autonomously adapt to changing conditions, and where the problems being analysed are so complex and complicated that no reliable and/or easy-to-implement and analyse theoretical models exist.AI and ML algorithms perform brilliantly in problems such as exploration and extraction of new knowledge from data; decision support or decision-making; signal, image or video processing and analysis; speech processing and analysis; intelligent diagnostic systems; intelligent and adaptive control systems or forecasting. Many of these problems can be found in the field of automation and robotics.

Prerequisites and co-requisites

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Colloquium</td><td>50.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>• Zhang, Aston and Lipton, Zachary C. and Li, Mu and Smola, Alexander J. Dive into Deep Learning, 2021.
• Bonaccorso, G. Algorytmy uczenia maszynowego. Zaawansowane techniki implementacji. Helion, 2019
• Szeliga, M. Data Science i uczenie maszynowe. Wydawnictwo Naukowe PWN, 2017.
• Bengio, Y., Courville A., Goodfellow I. Deep Learning. Systemy uczące się. Wydawnictwo Naukowe PWN, 2018.</td></tr>
<tr><td>Supplementary literature</td><td>• Sejnowski Terrence J. Deep Learning. Głęboka rewolucja. Wydawnictwo Poltext, 2019
• Chollet, F. Deep Learning. Helion, 2019</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">• Wytłumacz różnice pomiędzy uczeniem nadzorowanym, nienadzorowanym i uczeniem ze wzmocnieniem
• Wskaż zakres stosowalności, wady i zalety wybranego algorytmu sztucznej inteligencji</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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