GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| Subject name and code | Artificial intelligence, PG_00058310 | | |
| Field of study | Automation, Robotics and Control Systems | | |
| Date of commencement of studies | October 2023 | Academic year of realisation of subject | 2026/2027 |
| Education level | first-cycle studies | Subject group | Obligatory subject group in the field of study<br>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 | Department Of Intelligent And Decision Support Systems -> Faculty Of Electrical And Control Engineering -> Wydziały Politechniki Gdańskiej | | |
| 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_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 |
| [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 |

**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.<br>• Bonaccorso, G. Algorytmy uczenia maszynowego. Zaawansowane techniki implementacji. Helion, 2019<br>• Szeliga, M. Data Science i uczenie maszynowe. Wydawnictwo Naukowe PWN, 2017.<br>• 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<br>• 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<br>• 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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