



SZKOŁA GŁÓWNA
GOSPODARSTWA
WIEJSKIEGO

Deep Learning Methods

Educational subject description sheet

Basic information

Field of study Course Offer for exchange students - second cycle studies, including uniform master studies (MA programmes)		Didactic cycle 2024/25
Speciality -		Subject code PWMPWM2S_D.B100000.02500.24
Organizational unit Course Offer for exchange students		Lecture languages english
Study level second cycle studies, including uniform master studies (MA programmes)		Mandatory Obligatory subjects
Study form full-time studies		Block Special subjects
Education profile General academic		Disciplines Technical computing and telecommunications
Coordinator	Bartosz Świdorski	
Teacher	Bartosz Świdorski	
Period Winter semester	Examination Exam	Number of ECTS points 4
	Activities and hours Lecture: 15 Laboratory exercises: 30	

Goals

Code	Goal
C1	Knowledge of the basics of deep learning

Entry requirements

Knowledge of mathematical analysis, probability, and mathematical statistics

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge - Student knows and understands:			
W1	artificial intelligence algorithms and issues related to their implementation ; optimization methods and decision support systems, modern trends in this field; methods, techniques and tools used to solve simple IT tasks in the field of problems related to computational complexity and artificial intelligence; information acquisition and knowledge discovery technology; mathematics (including: statistics, differential and difference equations, elements of functional analysis) in the field of creating models of neural networks and other typical activities in the field of computer science.		Oral exam, Project, Case
Skills - Student can:			
U1	describe the proposed model, extended by the formulation of own opinions and a critical selection of data and methods of analysis (is able to select the appropriate IT and statistical tools to analyze social and economic problems).		Oral exam, Project, Case
Social competences - Student is ready to:			
K1	providing information on the importance of artificial intelligence methods in the current state of technology.		Oral exam

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	To acquaint students with the topics: - Fully Connected Neural Networks - Convolution Neural Networks - Siamese Networks - Autoencoders - Recurrent Neural Network - Generative Adversarial Networks - Reinforcement learning Examples of implementations of deep model models	W1, U1, K1	Lecture, Laboratory exercises

Course advanced

Activities	Methods of conducting classes
Lecture	Lecture, Problem lecture, Conversation lecture, Case study, Problem solving, Laboratory (experiment), learning by experiment
Laboratory exercises	Lecture, Case study, Problem solving, Individual work

Activities	Examination method	Percentage
Lecture	Project	20%
Lecture	Oral exam	20%
Lecture	Case	10%
Laboratory exercises	Project	20%
Laboratory exercises	Oral exam	20%
Laboratory exercises	Case	10%

Activities	Credit conditions
Lecture	the project, its defense, answers during classes
Laboratory exercises	the project, its defense, answers during classes

Literature

Obligatory

1. Deep Learning, Ian Goodfellow and Yoshua Bengio and Aaron Courville, MIT Press book, www.deeplearningbook.org
2. Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow, Concepts, Tools, and Techniques to Build Intelligent Systems, Geron Aurelien
3. Deep Learning with TensorFlow and Keras, Amita Kapoor Antonio Gulli, Sujit Pal

Calculation of ECTS points

Activity form	Activity hours*
Lecture	15
Laboratory exercises	30
Preparing a report	16
Preparation for exercises	24
Self-study on the content covered in class	20
Conducting literature research	15
Student workload	Hours 120
Number of ECTS points	ECTS 4

* hour means 45 minutes