COURSE DESCRIPTION CARD - SYLLABUS

Course name
Machine Learning for the Internet of Things

Course

Field of study
Computing

Year/Semester
1/2

Area of study (specialization)
Internet of Things

Profile of study
general academic

Level of study
Second-cycle studies

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
30	30	
Tutorials	Projects/seminars	

Number of credit points

5

Lecturers

Responsible for the course/lecturer:
dr inż. Tomasz Łukaszewski
email: Tomasz.Lukaszewski@put.poznan.pl
Faculty of Computing and Telecommunications
Piotrowo 3, 60-965 Poznan

Responsible for the course/lecturer:

Prerequisites

A student starting this course should have basic knowledge of Python programming and data analysis using machine learning techniques. He should also have the ability to obtain information from the indicated sources and be ready to handle cooperation within the team.

Course objective

Provide students with knowledge and skills in the field machine learning

Course-related learning outcomes

Knowledge

1. Has knowledge of machine learning with the use of complex models (e.g. sequential classification, Bayesian classifiers, neural networks, including deep networks)

2. Has knowledge of development trends and new achievements in machine learning

3. Knows advanced methods, techniques and tools used in solving complex engineering tasks in the field of computer science related to machine learning

Skills

1. Is able to plan and conduct experiments in the area of machine learning, interpret the obtained results and draw conclusions.

2. Is able - when formulating and solving engineering tasks in the area of Internet of Things - to integrate knowledge from different areas of computer science, especially machine learning.

3. Is able to assess the usefulness and applicability of new developments (methods and tools) and new IT products from the area of Internet of Things and machine learning.

4. Can assess the usefulness of machine learning methods and tools in the Internet of Things.

5. Is able to solve complex IT tasks in the area of Internet of Things, including tasks with a research component.

6. Is able - according to a given specification, taking into account non-technical aspects - to design an information system from the area of Internet of Things using appropriate methods, techniques and tools of machine learning.

Social competences

1. Understands that knowledge and skills become obsolete very quickly in computing.

2. Understands the importance of using the latest knowledge of machine learning in solving problems in the field of Internet of Things.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lecture is verified on a written test. Passing threshold: 50% of points. Final issues, on the basis of which the questions are developed, will be sent to students. The skills acquired during the laboratory classes are verified on the basis of the project resulting from the analysis of the indicated problem related to machine learning.

Programme content

The machine learning lecture schedule includes: SVM, sequential classification, Bayesian classification, neural networks and deep learning, regression.

The laboratory program includes in-depth issues discussed during the lectures. In the field of machine learning, libraries for the Python language were used, allowing for effective implementation of the discussed solutions.

Teaching methods

Lecture: multimedia presentation

Laboratory exercises: practical exercises, discussion, team work

Bibliography

Basic

1. Python. Uczenie maszynowe, Wydanie II, Sebastian Raschka, Vahid Mirjalili, Helion 2019

2. Uczenie maszynowe z użyciem Scikit-Learn i TensorFlow, Wydanie II, Aurelien Geron, Helion 2020

Additional

1. Naczelny Algorytm. Jak jego odkrycie zmieni nasz świat, Pedro Domingos, Helion 2016

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,0
Classes requiring direct contact with the teacher	60	2,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	65	2,5

[1] delete or add other activities as appropriate