COURSE DESCRIPTION CARD - SYLLABUS

Course name
Machine learning for the Internet of Things [N2Inf1-AMiWdIP>UMASZ]

Course

Field of study
Computing

Year/Semester
2/3

Area of study (specialization)
Mobile and Embedded Applications for the Internet of Things

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
part-time

Requirements
elective

Number of hours

Lecture
16

Laboratory classes
16

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

The student starting this course should have basic knowledge of Internet technologies, basics of logic and databases, and programming in Python. He should also have the ability to obtain information from the indicated sources and be ready to cooperate as part of the team.

Course objective

Provide students with knowledge and skills in the field of data analysis using machine learning techniques: classification, managing unknown feature values, mapping feature values, scaling feature values. Machine learning will be emphasized.

Course-related learning outcomes

Knowledge:
1. Has advanced detailed knowledge of data classification and pre-processing
2. Has knowledge of development trends and new achievements in machine learning
3. Knows advanced methods, techniques and tools used to solve complex engineering tasks in the field of computer science related to machine learning

Skills:
1. He can plan and carry out experiments in the area of machine learning
2. Can assess the usefulness of machine learning methods and tools in the Internet of Things

Social competences:
Understands that in computer science, knowledge and skills very quickly become obsolete.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired in the lecture will be tested in a credit test. Pass mark: 50% of the mark. Optionally, the mark can be increased by an oral examination.

The skills acquired in the laboratory classes are verified on the basis of mini-projects resulting from the analysis of a designated problem related to machine learning.

Programme content

Machine learning problems: classification, data preprocessing, feature selection, clustering.

Course topics

The lecture program includes: introduction to machine learning, classification problems as one of the machine learning paradigms, nearest neighbor classifier, decision trees, management of unknown feature values, feature value mapping and scaling, feature discovery, feature selection, data clustering.

Laboratory classes: deepening the issues discussed in lectures by solving practical problems using, among others, the scikit-learn library for the Python language and the Jupyter environment (Jupyter notebooks).

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
Additional
1. Naczelny algorytm. Jak jego odkrycie zmieni nasz świat. Pedro Domingos. Helion 2016

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	32	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	43	1,50