COURSE DESCRIPTION CARD - SYLLABUS

Course name
Data Analysis for the Internet of Things

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 studies

Course offered in
Polish

Form of study
part-time

Requirements
elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
16	16	
Tutorials	Projects/seminars	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
dr inż. Tomasz Łukaszewski

Responsible for the course/lecturer:

dr inż. Jędrzej Potoniec

Prerequisites

A student starting this course should have basic knowledge of artificial intelligence, databases and programming in high-level languages. 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 basic knowledge of data analysis in the field of data visualization and data generalization to knowledge models (supervised learning) by selecting features and building classifiers, including kNN, decision trees, naive Bayesian classifier, neural networks. Developing students' problem-solving skills in the field of using and designing systems using supervised learning with the use of Python and libraries for this language.

Course-related learning outcomes

Knowledge

1. Has advanced detailed knowledge of data visualization and supervised learning

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

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

Skills

1. Can plan and carry out experiments in the area of supervised learning, interpret the obtained results and draw conclusions

2. Can assess the usefulness of methods and tools for supervised learning 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 during the lecture is verified with a passing test. Passing threshold: 50% of points. The completion of the questions on the basis of which the questions are developed will be given to students before the completion of the exam. The skills acquired during the laboratory classes are verified on the basis of tasks related to the analysis of the identified problems related to data visualization and supervised learning.

Programme content

The lecture program covers the following topics: data analysis using supervised learning (goal: understanding data and data generalization to knowledge models). Approaches: feature selection, kNN, decision trees, naive Bayesian classifier, neural networks.

The laboratory program includes data visualization and in-depth issues discussed during the lectures: supervised learning with the use of modules for the Python language and sample programs that constitute the basis for the implementation of independent tasks.

Teaching methods

lecture: multimedia presentation

laboratory exercises: practical exercises, discussion, team work

Bibliography

Basic

1. Python: uczenie maszynowe, Sebastian Raschka, Helion 2018

Additional

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

2. Człowiek na rozdrożu. Sztuczna inteligencja 25 punktów widzenia. John Brockman (Edytor), Helion 2020

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	32	1,3
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	43	1,7

[1] delete or add other activities as appropriate