Study programme(s): Information Technologies
Level: Bachelor
Course title: Artificial intelligence 1
Lecturer: Miloš Racković
Status: elective
ECTS: 7
Requirements: none

Learning objectives

Introducing students to the basic principles of artificial intelligence (AI) and training for the implementation of the software applications with elements of knowledge representation, search and reasoning.

Learning outcomes

Minimum: At the end of the course, it is expected that a successful student is able: to understand the basic AI concepts, to implement the software application for solving different problems with the search through the state space, to implement the intelligent game player as well as to implement the knowledge based agent.

Desirable: At the end of the course, it is expected that a successful student is able to implement the knowledge based system with fully understanding of the logic reasoning and the more complex AI principles.

Syllabus

Theoretical instruction

AI history. Intelligent agents. Search based problem solving: uninformed (blind) and informed (heuristic) search strategies. State space search in game playing: MinMax algorithm. Illustrative example of implementation of MinMax algorithm in game with two players. Knowledge representation and reasoning in first order logic. Ontological engineering and semantic networks. Uncertain knowledge and reasoning. Making decisions in AI sistems. Basics of machine learning. Basics of natural language processing.

Practical instruction

Implementation of standard algorithms for state space search in object-oriented programming language. Implementation of MinMax algorithm in the illustrative game with two players. Implementation of knowledge representation and reasoning in declarative programming language.

Literature

Recommended

- Russell, S.J, Norving, P., "Artificial Intelligence: A Modern Approach (third edition)", Pearson Education, Inc., publishing as Prentice Hall, United States of America, 2010.
- Miloš Racković, *Скрипта из предмета Вештачка интелигенција I - Основни концепти вештачке интелигенције*, University of Novi Sad, Faculty of sciences, Department for mathematics and informatics. Novi Sad, 2003.

Weekly teaching load				
Lectures: 2	Exercises: 1	Practical Exercises: 2	Student research:	Other:

Teaching methodology

Classical methodology is applied during lectures. Teacher explains basics of the intelligent systems and modern AI principles. In the exercises the active students' participation is encouraged, with the goal of better understanding of AI concepts. The knowledge of students is tested during the exercises through two practical tests, which cover the materials that were presented. At the oral part of examination students demonstrates their understanding of principles on which intelligent systems is based.

Grading method (maximal number of points 100)

Pre-exam obligations	Points	Final exam	points
students' activity	10		
two practical tasks	50 (25+25)	oral examination	*40*