Multi-agent systems - course description

General information

Course name	Multi-agent systems
Course ID	11.9-WE-AutD-M-aS-Er
Faculty	Faculty of Computer Science, Electrical Engineering and Automatics
Field of study	Automatic Control and Robotics / Computer Control Systems
Education profile	academic
Level of studies	Erasmus programme
Beginning semester	winter term 2017/2018

Course information

Semester	2
ECTS credits to win	2
Course type	obligatory
Teaching language	english
Author of syllabus	• dr inż. Jacek Bieganowski
	• dr inż. Marek Wróblewski

Classes forms

The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	15	1	-	-	Credit with grade
Project	15	1	-	-	Credit with grade

Aim of the course

- To introduce students to novel techniques of building distributed intelligent systems.
- Todevelop skills in working in a group and designing software components responsible for multi-robot coordination.

Prerequisites

Programming with essentials of algorithmics, Artificial intelligence methods, Distributed systems

Scope

Introduction. Agents and objects. Agents and expert systems. Agents and distributed systems. Typical behaviours of agent systems. Intelligent agents. Abstract architectures for intelligent agents. Design of intelligent agents.

Deductive reasoning agents. Agents as reactive systems. Hybrid agents. Multiagent systems. Social aspects of agency theory. Coordination techniques. Distributed problem solving. Collaboration: cooperative distributed problem solving (CDPS), partial global planning, consistency and coordination.

Distributed and dencetralised systems engineering. Multi-agent systems as complex systems. Engineering autonomic systems using agent-based techniques. Applying multiagent systems to model distributed, multi-robot systems in cooperative scenarios.

Decentralised control techniques based on bio-inspired coordination algorithms.

Teaching methods

Lecture, project assignment.

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Skills and competencies needed to design intelligent autonomous agents.		• a preparation of a project • an exam - oral, descriptive, test and other	• Lecture • Project
Skills and competencies of designing multi-agent systems together with techniques to enable communication and cooperation in such systems.		• a project	• Project
Knowledge of the main approaches and techniques to implement software agents.		• an exam - oral, descriptive, test and other	• Lecture

Assignment conditions

Recommended reading

1. M. Wooldridge. Multi-agent systems (second edition), MIT Press, 2013

2. Y. Shoham and K. Leyton-Brown Multiagent Systems: Algorithmic, Gamer-Theoretic, and Logical Foundations, Cambridge University Press, Cambridge, 2008

Further reading

1. M. Wooldridge, An Introduction to MutliAgent Systems, Wiley, Chichester, 2009

Notes

Modified by dr hab. inż. Wojciech Paszke, prof. UZ (last modification: 03-05-2020 20:57)