

Multi Agent Systems

Programme course

6 credits

Multiagentsystem

TDDE13

Valid from: 2017 Spring semester

Determined by

Board of Studies for Computer Science and
Media Technology

Date determined

2017-01-25

Main field of study

Computer Science and Engineering, Computer Science

Course level

Second cycle

Advancement level

A1X

Course offered for

- Computer Science and Software Engineering, M Sc in Engineering
- Computer Science and Engineering, M Sc in Engineering
- Information Technology, M Sc in Engineering
- Computer Science, Master's programme

Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites

An introductory AI course, knowledge of programming, probabilities, and logic.

Intended learning outcomes

The overall aim of the course is to give an overview of multiagent systems and in depth knowledge of some areas of multiagent systems. After the course students should be able to:

- List and explain important problems and techniques in the area of multiagent systems.
- Explain how central algorithms in the area of multiagent systems work. - Be able to

- implement some central algorithm in the area of multiagent systems.
- Evaluate and apply different game theoretic approaches.
- Design and use auctions for allocating resources in a multiagent system.
- Model relevant aspects of multiagent system decision making using markov decision processes and logics.

Course content

- Architectures for multiagent systems
- Distributed AI, including distributed constraint satisfaction and optimization
- Game theory, including normal form and extensive form games
- Communication, including speech acts
- Aggregated preferences, including voting
- Auctions for multiagent resource allocation
- Logics for multiagent systems
- Multiagent decision-making, including task allocation

Teaching and working methods

Lectures, seminars and labs. Lab assignments will be used to learn more about the practical aspects of multiagent systems and explore some techniques in more detail. The examination will mainly be homework exercises.

Examination

LAB1	Laboratory work	U, G	2 credits
UPG1	Assignments	U, 3, 4, 5	4 credits

Grades

Four-grade scale, LiU, U, 3, 4, 5

Department

Institutionen för datavetenskap

Director of Studies or equivalent

Peter Dalenius

Examiner

Fredrik Heintz

Education components

Preliminary scheduled hours: 60 h

Recommended self-study hours: 100 h

Course literature

Additional literature

Books

Shoham, Yoav and Leyton-Brown, Kevin, (2009) *Multiagent systems - Algorithmic, Game-Theoretic and Logical Foundations* Cambridge University Press
ISBN: 978-0-521-89943-7

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.