ID2009 Artificial Intelligence: Principles and Techniques 7.5 credits

Artificiell intelligens: principer och tekniker

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for ID2009 valid from Autumn 2008

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Specific prerequisites

For single course students not attending a regular KTH Programme the following is required:

- completed and documented upper secondary education including documented proficiency in English for applicants without knowledge of Swedish, shich is one of the general requisites for undergraduate studies in Sweden AND
- docuemtende university records corresponding to 180 hp/Bacherlor´s degree within Computer Science or equivalent.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

Learning outcomes On successful completion of this course the student has:

Knowledge and understanding regarding:

- the objectives and the historical development of the field of artificial intelligence
- basic techniques for knowledge representation,
- basic techniques for automated reasoning, in particular search techniques and production systems
- basic techniques for machine learning
- the principles of symbolic programming
- major categories of applications of artificial intelligence techniques.

Skills and capacities, to be able to:

- design representations for particular problems, suitable for applying uninformed as well as informed search techniques
- apply uninformed as well as informed search techniques for particular problems
- model domain knowledge in terms of formal rules
- apply rule-based reasoning schemes to particular problems
- capture uncertain domain knowledge in representations
- implement problem solving schemes including representation and reasoning in terms of logic programming
- apply non-symbolic representation and reasoning schemes.

Values and attitudes, to be able to:

- compare the usefulness of alternative search techniques
- judge the validity and consistency of representations
- judge the validity of reasoning schemes with respect to particular problems
- compare symbolic and sub-symbolic approaches to problem solving.

Course contents

A brief description of course contents

• Introduction to the field of artificial intelligence including objectives, core technologies and applications.

• Introduction to knowledge representation including both symbolic and sub-symbolic approaches. Symbolic approaches include both logic and graph-based schemes while sub-symbolic schemes include both connectionist and evolutionary computation representation schemes.

• Introduction to automated reasoning, including search techniques, production rule systems, connectionist and evolutionary computation reasoning schemes.•

Introduction to machine learning, including symbolic inductive learning techniques as well as connectionist and evolutionary computation learning schemes.

Disposition

The backbone of teaching consists of a series of lectures. The core of the course content is covered in four assignments, which are required to be solved and handed in on a weekly basis. The work on the assignments is supported by supervision in groups and individually.

Course literature

Luger, George F.., "Artificial Intelligence Structures and Strategies for Complex Problem Solving, Addison Wesley.

Examination

• TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F

• LAB1 - Assignment, 4.5 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Assessment on the course consists of four assignments (two individual and two performed in groups of two) and one written exam. To pass the whole course requires pass on both the assignments and the written examination.

Other requirements for final grade

Lab work (LAB1; 4,5 hp), written exam (TEN1; 3 hp)

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.