Faculties of Humanities and Theology

KOGP05, Cognitive Science: Neuro Modelling, Cognitive Robotics and Agents, 7.5 credits

Kognitionsvetenskap: Neuromodellering, kognitiv robotik och agenter, 7,5 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by The pro-dean for First-Cycle Studies at the Faculties of Humanities and Theology on 2010-08-25 to be valid from 2010-08-25, autumn semester 2010.

General Information

The course is a component of the Master's programme in Cognitive Science (HAKOG).

Language of instruction: Swedish

Main field of studies	*Depth of study relative to the degree requirements*
Cognitive Science	A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

On completion of the course, the students shall be able to:

Knowledge and understanding

- describe different types of cognitive models and account for modelling as a method
- provide examples of how it is possible to find and implement new technical solutions based on knowledge and inspiration from biological solutions
- compare alternative solutions to cognitive models with regard to technical design, required resources and function
- provide a qualified account of cognitive science methods and current issues

Competence and skills

- implement a project according to the criteria and goals set by the course administration together with the project group for the development/refinement of digital or robotic interactive systems
- demonstrate and provide arguments for the priorities that are necessary in the development of digital or robotic interactive systems
- carry out discussions with different groups and work efficiently in teams consisting of mixed groups with different skill sets

Judgement and approach

- take a position on the ethical aspects of research and development
- evaluate the potential and limitations of different methods and take a position on how and why it is favourable to combine certain methods.

Course content

Using computer models, embodied as robotic systems in a physical environment or as virtual agents in a digital environment, students explore cognitive phenomena such as attention and learning. In cognitive science, different kinds of models are used to understand the processes that give rise to cognition. These models try to describe the brain or a cognitive phenomenon in a precise way e.g. in the form of equations or computer programs. The models can be either descriptive or predictive. Descriptive models summarise data in a standardised manner to provide better understanding. Predictive models are also able to be used to generate data that can be tested e.g. in an experiment. The purpose of creating models can be to explore cognitive processes or to generate new hypotheses. The aim can also be to find biologically inspired methods to solve technical problems. For example, artificial neural networks are used both to model the brain and as a technical method.

The course is heavily project-oriented and the students develop or refine their own specific prototypes of technical systems based on different cognitive models. Depending on the project choice, the focus point of the projects will vary, but all will include: i) technical development, ii) a cognitive science specialisation and iii) a focus on interaction design.

Course design

Lectures, laboratory sessions/exercises, project supervision sessions, oral project presentation, written project report

Assessment

The assessment of the course is based on an oral project presentation and a written project report.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.

Entry requirements

To be admitted to the course, students must have successfully completed KOGM01 or the equivalent.

Subcourses in KOGP05, Cognitive Science: Neuro Modelling, Cognitive Robotics and Agents

Applies from V10

1001 Neuro Modelling, Cognitive Robotics and Agents, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction