SYLLABUS

Introduction to AI 7.5 credits Z0009E

Introduktion till AI

Course syllabus admitted: Autumn 2021 Sp 1 - Present

DECISION DATE
2021-04-28

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LULEÅ TEKNISKA UNIVERSITET

Introduction to AI 7.5 credits Z0009E

Introduktion till AI

First cycle, Z0009E

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	U G VG	Datalogi	Computer Technology

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and Knowledge in English, equivalent to English 6

Selection

Examiner

Marcus Liwicki

Course Aim

In this course students will gain knowledge about

- the Master Programme in Applied Artificial Intelligence at Luleå University of Technology, and being a professional student at Luleå University of Technology
- the basics of artificial intelligence and machine learning.

Upon course completion, the student shall be able to

- independently, and in writing reflect on their own learning, summarizing the key points and take-aways of course material, while listing and citing (in accordance with academic standards) a minimum of five relevant resources at the appropriate places
- evaluate the work of their peers by providing feedback in writing, given a set of well-defined criteria (e.g., rubrics) for evaluation
- define the area of Artificial Intelligence (in particular, with relation to control theory and computer science), and shortly describe its major fields
- list a minimum of three existing tools implementing AI methods, and describe their basic characteristics
- given two existing tools implementing AI methods, compare them with respect to their basic characteristics.
- Given a real-life applied AI problem that the student has encountered during the course, or that is analogue to those the student encountered during the course:
    - categorize the problem using standard concepts
    - list a minimum of three appropriate AI methods to tackle the problem
    - describe in their own words at minimum two appropriate AI methods to tackle the problem
    - apply one appropriate AI method to tackle the problem, given access to the necessary tool implementing AI methods, and data relevant to the problem.
- Indicate and discuss business aspects, as well as ethical, gender, and sustainability issues related to AI.

Contents

The course content will cover both general skills (e.g. reflection on learning, feedback methods, information retrieval and referencing) aimed at participants to become professional students, as well as topics of domain knowledge. These topics are as follows: Artificial Intelligence as a subject area, its history and its precursors, a basic introduction into robotics, reasoning and retrieval systems, machine learning (including data cleaning, pre-processing, dimensionality reduction, regression, classification, clustering, model evaluation), neuroscience concepts, and the business and ethical aspects of AI.

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
Lectures will be given live as well as in the form of short videos uploaded to Canvas. Lectures will be interspersed with ungraded quizzes for the purpose of student activation, and continuous, knowledge-enhancing feedback. Lectures will be supplemented with weekly laboratory session where students can discuss assignments with the teaching assistants, and weekly live sessions where students can ask the instructors. Course assignments will be given in the form of written assignments, multiple-choice questions or code completion tasks given after each unit (collection of lectures) is complete. For each assignment to be solved, there will be videos related to the assignment. At the end of the course, a panel discussion will be organized where invited speakers from the AI field and participants will discuss about the current progress and trends of AI, its applications and the future of AI. The course will end with a final quiz and oral exam.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.
Web based and written course assignments. The assignments will be given throughout the course in order to evaluate the progress of the students, and to provide feedback for the continuation of the course. Furthermore, there will be a final written quiz and an oral exam.

Remarks

Participants are encouraged to:

- Use their personal computers during the course
- Have internet connection (minimum 0,5 Mbps)
- Have a web camera and microphone
- Install on the computers they use the tools necessary for the course

Literature. Valid from Autumn 2021 Sp 1

Title: Artificial Intelligence : A Modern Approach
Author: Stuart J. Russel and Peter Norvig

Elements of AI (https://www.elementsofai.com/)

Course offered by

Department of Computer Science, Electrical and Space Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Compulsory assignments	U G#	3	Mandatory	A21	
0002	Written and oral exam	U G VG	4.5	Mandatory	A21	

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Syllabus established

by Jonny Johansson, HUL SRT 2021-04-28