UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Artificial Intelligence

2122-2-F9201P033

Aims

The aims of the course concern theoretical, methodological, and practical issues related to the area of Artificial Intelligence (AI); in particular the course:

- is aimed at supplying basic knowledge necessary to avalyse and evaluate the applicability of existing AI solutions to specific problems;
- is aimed at discussing methodological issues related to the application of AI techniques to specific domains and contexts of application;
- is aimed at presenting some specific technical and technological soluzions for experimentation by the students.

Contents

The course will present an historical introduction to the discipline, then it will focus on selected contribution in the area of the so-called symbolic AI, with specific reference to ontologies and languages, standards, and technologies of the Semantic Web. Finally, selected contributions of the so-called sub-symbolic AI will also be discussed, with specific reference to data analysis techniques (clustering).

Detailed program

1. Historical introduction of AI

2. Symbolic AI
    1. Brief introduction to basic concepts
    2. Semantic Web introduction
    3. efining knowledge graphs with RDF, RDFS
    4. Querying knowledge graphs with SPARQL
    5. Enabling tools: DBPedia, WikiData, Protegé
3. Sub-symbolic AI
    1. Brief introduction to basic concepts
    2. Data analysis with AI techniques
    3. Classification
    4. Clustering
    5. Enabling tools: OpenRefine, KNIME

Prerequisites

No particular prerequisite. Basic mathematics, statistics, computer programming proficiencies could be useful to understand the discussed topics and to implement the project required for the final assessment. It is mandatory the will and intention to experiment even in a very practical way innovative informatics technologies.

Teaching form

Theoretical and methodological aspects will be presented along with practical examples and case studies, employed to exemplify the introduced topics; specific tools for the realization of presented models and approaches will be presented; suitable references to the relevant and recent scientific literature will be given for supporting an in depth study of the treated topics. The course is in Italian although the teaching material is mostly in English.

The 2020/21 edition was held from remote (recorded lessons and some "live" lessons, held via teleconference systems, and however also recorded), we foresee that the 2021/22 edition will be traditional (in presence), but any change will depend on the state of the COVID-19 outbreak.

Textbook and teaching resource

Slides, papers and selected additional material, selected chapters from reference books, among which Artificial Intelligence: Foundations of Computational Agents, 2nd Edition, David L. Poole and Alan K. Mackworth (https://artint.info/2e/html/ArtInt2e.html).

Semester

First semester

Assessment method

Project (usage experience, improvement or development of a prototypal system for the solution of a practical problem) or essay (survey, approaches/tool comparison, evaluation of applicability of existing instrument).

The topic of the essay and project is typically agreed upon with the instructor, even during the course; the instructor provides an assessment of the adequacy and level of difficulty of the proposed work, and he proposes indications for the organization of work.

Office hours

Wednesday morning, by appointment, potentially also via teleconferencing systems.