Fundamentals of Artificial Intelligence
Chapter 00: **Course Overview**

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M.S. Course "Artificial Intelligence Systems", academic year 2022-2023

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Outline

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1. Practical Information

2. About the Course

Legal Notice

Important:

Please be aware that all classes may be video-recorded (including students' questions & speeches) and that the recordings may be made available online.

Target

- The course will be given in English.
- The course is intended for 1st year students of the M.S. program "Artificial Intelligence Systems" at DISI, University of Trento.
    - Students from other programs, however, are welcome.

Timetable

1st Semester, September 12th–December 16th/22nd

- CLASS: Monday 09.30-11.30, Room A104 (Povo 1)
- LAB: Wednesday 11.30-13.30, Room A102 (Povo 1)
- CLASS: Friday 09.30-12.30/13.30, Room A207 (Povo 1)$^{(*)}$

The course is given **in presence.**

$^{(*)}$ four hour-slot: may be used to catch up with some missed class

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Office Hours & Forum

Office hours:

- No weekly fixed-day
- Anytime in the week, upon appointment only
- In presence (only after class) or via zoom
- Appointments to be set in class or via email
- Office hours only during class period (see above)!

Forum

A forum for Q&A is available at the course page in the Moodle platform

You shall register to the Moodle platform of the course!

Important: Email Communications

Important

Teaching this course is only part of our job, and we receive a huge amount of email. Thus:

- email to both me and the teaching assistant
- use as subject "[Fundamentals of AI]: subject"
- email only from your "official" UNITN email address "name.surname@studenti.unitn.it"
- email for relevant reasons only
- be polite and respectful, with both me and the T.A.
  (see e.g. "Bad Email Reply – What not to say to your professor")

PS: Notice that even professors use social media (example)

Outline

Motivations & Goals

- Artificial Intelligence (hereafter simply "AI") is an umbrella term, covering a large and heterogeneous amount of disciplines (e.g. problem solving, knowledge representation and reasoning, planning, reasoning under uncertain knowledge, learning, ...).
- This course aims at providing an overview of the foundations of AI and of (some of) its main disciplines in an organic way.
- Examples and exercises will be provided during the course.
- The course consists also in a series of lab sessions, where student will be required to run simple exercises consisting in modeling and solving simple problems by means of AI techniques and tools, and to solve simple exercises by hand.

Notice: "lab" here means "exercise session": no programming or use of tools.

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Topics

Covered Topics

The main topics covered in the course are (not necessarily in order):

- Introduction to AI
- Intelligent Agents
- Problem Solving & Search
- Constraint Satisfaction
- Logic & Logical Agents
- Automated Inference & Reasoning
- Automated Planning
- Knowledge Representation
- Uncertain Knowledge and Reasoning

Topics (cont.)

Un-covered Topics

The following topics will *not* be covered in the course

- Machine Learning ($\implies$ ad-hoc course)
- Natural-Language & Speech ($\implies$ ad-hoc course)
- Image Recognition & Computer Vision ($\implies$ ad-hoc course)
- Robotics ($\implies$ ad-hoc course)
- AI & NeuroScience ($\implies$ ad-hoc course)
- Ethics in AI ($\implies$ ad-hoc course)
- AI & Philosophy
- AI & Psychology
- ...

References & Material

- Your notes from the lessons
- Slides (will be progressively available from the URL of the course)
- Other material (available from the URL of the course)
- The textbook:
  Stuart Russell & Peter Norwig.
  "Artificial Intelligence. A Modern Approach" (a.k.a. "AIMA")
  3rd Edition. Pearson. (The 4th Edition has been recently released)
  `http://aima.cs.berkeley.edu/`
- Supplementary material from the AIMA URL
- Feel free to buy the (very recent) fourth edition

About the AIMA Book

- Leading textbook in AI
- Adopted by over 1400 schools in over 120 countries.
- Lots of extra material & documentation
- Fundamental book in a AI professional's bookshelf
- Currently 3rd Edition,
  4th Edition has recently been published
- Electronic versions available
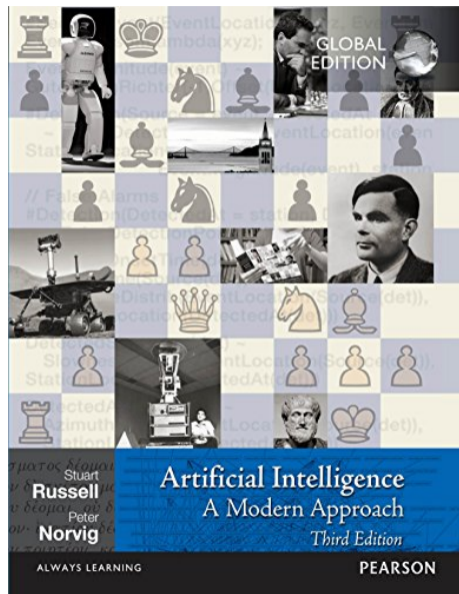
Acknowledgments & Disclaimer

- Many examples & figures in these slides are from the AIMA book
- Some other material presented in these slides (text, figures, examples) is courtesy of the following people, listed in alphabetical order:
  - Pieter Abbeel
  - Anca Dragan
  - Dan Klein
  - Nikita Kitaev
  - Tom Lenaerts
  - Michela Milano
  - Dana Nau
  - Maria Simi
  - ... (others to be added)

  and, of course,
  - Stuart Russell & Peter Norwig

Requirements

- It is assumed some basic background in the following topics:
  - basic mathematics
  - probability theory
  - algorithms and data structures
  - programming
- Some background in the following topics could be useful (but not necessary):
  - Boolean logic
  - automata and formal languages
  - software engineering

Note

The adopted textbook "Artificial Intelligence. A Modern Approach" provides appendixes with mathematical background and some notes on languages and algorithms.

Exam

- The exam will consist in a script session, with a combination of multiple-answer questions, brief open questions, and small exercises,
- Aims at assessing the acquired knowledge about both the main concepts and the main techniques.
- This script exam may be handled either on paper or (in part or completely) at the terminal, depending on circumstances.
- The final evaluation will consider both the acquired knowledge and the acquired skills in solving small exercises.

Depending on various circumstances, the exam modalities might be subject to variations, which in case will be communicated to student in due time.

To copy at exams very dangerous is!