Introduction to Artificial Intelligence

Fall 2018

Prof. Gilles Louppe
g.louppe@uliege.be

LIÈGE université

Logistics

This course is given by:

- Theory: Prof. Gilles Louppe [g.louppe@uliege.be]

- Exercises: Antoine Wehenkel [antoine.wehenkel@uliege.be]

- Projects: Samy Aittahar [saittahar@uliege.be]

Feel free to contact any of us for help!

Slides

Slides

- are available at https://github.com/glouppe/info8006-introduction-to-ai.

- are available in HTML and in PDFs.

- will be posted online the day before the lesson.

- will be slightly different from previous years.

Some lessons are partially adapted from [CS188] Introduction to Artificial Intelligence, by Dan Klein and Pieter Abbeel from UC Berkeley.

Textbook
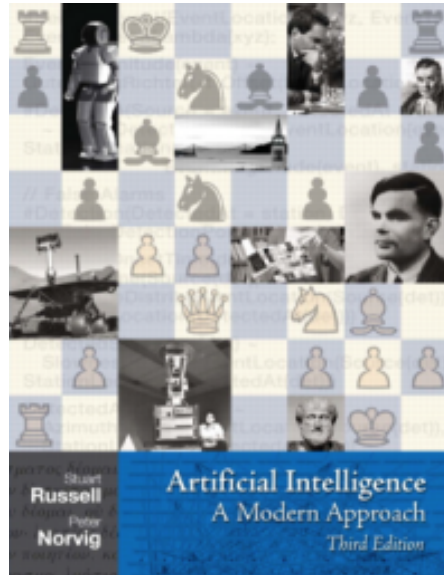
The core content of this course is based on the following textbook:

> *Stuart Russel, Peter Norvig. "Artificial Intelligence: A Modern Approach",*
> *Third Edition, Global Edition.*

This textbook is strongly recommended, although not required.

Philosophy

Thorough and detailed

- Understand the landscape of artificial intelligence.

- Be able to write from scratch, debug and run (some) AI algorithms.

Well established algorithms and state-of-the-art

- Well-established algorithms for building intelligent agents.

- Introduction to materials new from research ($\leq$ 5 years old).

- Understand some of the open questions and challenges in the field.

Practical

- Fun and challenging course project.

Lectures

- Theoretical lectures

- Exercise sessions

Outline

- Lecture 1: Foundations

- Lecture 2: Solving problems by searching

- Lecture 3: Constraint satisfaction problems

- Lecture 4: Adversarial search

- Lecture 5: Representing uncertain knowledge

- Lecture 6: Inference in Bayesian networks

- Lecture 7: Reasoning over time

- Lecture 8: Making decisions

- Lecture 9: Learning

- Lecture 10: Communication

- Lecture 11: Artificial General Intelligence and beyond

Projects

Reading assignment

Read, summarize and criticize a major scientific paper in Artificial Intelligence.
(Paper to be announced later.)

Programming project

Implement an intelligent agent for playing Pacman. The project will be divided into three parts, with increasing levels of difficulty:

- Eat as much dots as possible

- Eat as much dots as possible, while not getting killed by ghosts (deterministic)

- Eat as much dots as possible, while not getting killed by ghosts (stochastic)
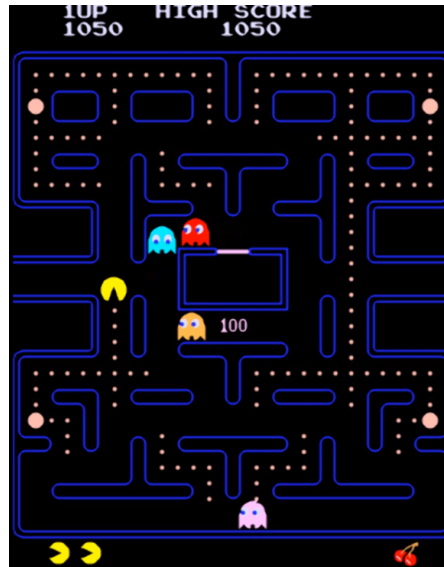
Evaluation

- Oral exam (60%)

- Reading assignment (10%)

- Programming project (30%)

Projects are mandatory for presenting the exam.

Going further

This course is meant as an introduction to the many other courses available at ULiège and related to AI, including:

- ELEN0062: Introduction to Machine Learning

- INFO8004: Advanced Machine Learning

- INFOXXXX: Deep Learning (Spring 2019)

- INFO8003: Optimal decision making for complex problems

- INFO0948: Introduction to Intelligent Robotics

- INFO0049: Knowledge representation

- ELEN0016: Computer vision

- DROI8031: Introduction to the law of robots

Let's start!