Introduction to Artificial Intelligence (G51IAI)

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Module Introduction
An Overview of This Session

- What is AI?
- Module introduction
  - Aims of the module
  - Module context
  - Textbooks + useful readings
  - Lecture resources
  - Assessments
  - Info of previous exams
What is AI?

- **Artificial intelligence** (AI) is the intelligence exhibited by machines or software. It is an academic field of study which studies the goal of creating intelligence.

- Major AI researchers and textbooks define this field as "the study and design of intelligent agents", where an intelligent agent is a system that perceives its environment and takes actions that maximize its chances of success.

- **John McCarthy**, who coined the term in 1955, defines it as "the science and engineering of making intelligent machines"

  *Wikipedia, 2015*
What is AI?

- AI is the study of how to make computers do things which, at the moment, people do better. 
  
  *Elaine Rich, 1991*

- AI is a branch of computer science and engineering that deals with intelligent behaviour, learning, and adaptation in machines.

  *Wikipedia, 2009*
What is AI?

- Can machines ever be intelligent?
  - A.I. Artificial Intelligence (2001)
  - Director: Steven Spielberg
  - Philosophy film

- Other movies about AI?
Wolfgang von Kempelen
“The Turk”
18th Century
Chess Automaton
1770-1854
What is AI?

- IBM Deep Blue
  - Chess champion Garry Kasparov
  - 11 May 1997
  - 2 vs. 1, three draws
What is AI?

- What is intelligence?
  - Understanding languages
  - Automated reasoning
  - Usually require knowledge
  - **Understanding**
    - Chinese room experiment
    - How Siri works?
  - Computers can play strong games, and a chimpanzee can play poor games?
    - There are non-intelligent ways to achieve intelligent tasks
Module Introduction

- G51IAI Web Page at Moodle
  - All lecture slides and additional notes
  - Assessments
  - Textbooks
  - Module schedule (being updated)
  - Other resources
  - Previous exam paper/example questions
Module Introduction

- Lectures
  - Handouts/notes, summary of each lecture
  - Willingness to answer questions, i.e. mailing list
  - Course content not too much / too little

- Teaching method
  - Lectures, office hours: approx. 25 hours
  - Private study: approx. 40 hours
  - Lab exercises: approx. 5 hours
  - Revision: approx. 30 hours
Assessment

- 100% examination
  - 2 hours
  - 4 compulsory questions
  - Each question 25%, roughly 30 minutes
  - Covers ALL lectures content excl. lab exercises
Module Introduction

- Lecture time – location
  - Thursday 14.00–16.00, EXCH LT2
  - Lecture schedule might be slightly adjusted (if so enough notice will be given)

- Office hours
  - Friday 12.00–13.00, C71
  - Starting from Week 3 in Spring
  - Except 27th Feb and 20th March
Aims of the module

- Define what we mean by **AI**
- Allow the students to become familiar with **AI software**
- Provide an understanding of the basic theory of a **range of AI techniques**
Module Introduction

- Aims of the module
  - Introduce insights of AI *history*, i.e. key milestones
  - Provide necessary knowledge to implement some AI techniques
  - Introduce game playing techniques
  - Introduce a number of AI *applications*
Textbooks


“Artificial Intelligence (AI) is a big field and this is a big book” (Preface to AIMA)

Most comprehensive textbook in AI

Much of the material for this course is from this book, available from library.
Textbooks


Web site: http://aima.cs.berkeley.edu/
Textbook in many courses

Better to be used as reference book
You don’t have to learn and read the whole book
Textbooks

  
  Chap 1 : Introduction
  Chap 3 : Solving Problems by Search
  Chap 4.1 : Informed (Heuristic) Search
  Sections 5.1 & 5.2 : Backtracking Search
  Chap 6 : Adversarial Search
  Section 20.5 : Neural Networks
  Chap 26 : Philosophical Foundation
  Etc ...
Textbooks

  - Good AI textbook, mainly concerns intelligent systems
  - Easy to read while in depth
  - Available from the library
Lecture Schedule

- Session 1: Introduction & History of AI (today)
- Session 2: Problem Space & Search
- Session 4: Heuristic Search
- Session 5: Artificial Neural Networks
- Session 6: Data Mining
- Session 7: Game Playing
- Session 8: Theorem Proving & Knowledge Representation
- Session 9: Lab (to practice ANN in Matlab, optional)
- Session 10: Office hour (Q&A, feedback)

Office hours: most Fridays 12.00–13.00, C71, from Week 3 (check Moodle)