Lecture 1 - CS486 Introduction

Jesse Hoey
School of Computer Science
University of Waterloo

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Readings: Poole & Mackworth 1.1
People, books, web

People:
- Jesse Hoey (Instructor)
- Frederic Bouchard (TA)
- Amir Farrag (TA)
- Eshan Ganjidoost (TA)
- Camilo Andres Munoz Bravo (TA)
- Atrisha Sarkar (TA)

Lectures:
- Section 001: M/W 11:30am-12:50pm in E2-1736
- Section 002: M/W 8:30am-9:50am in MC-1056

Office hours: TBA

Office hours (TA): near assignment due dates
Assignments, etc

- **CS486 (undergrad students)**
  - 4 Assignments (40%: 10% each)
  - 1 midterm exam (15%) (Feb 8th, 630pm in M3-1006)
  - 1 final exam (45%) (must pass to pass course)
  - optional project (5% bonus, proposal at midterm)

- **CS686 (grad students)**
  - 4 Assignments (25%: 6.25% each)
  - 1 midterm exam (10%) (Feb 8th, 630pm in M3-1006)
  - 1 final exam (35%)
  - 1 project report (30%, proposal due at midterm)

- Students wishing to write a project (and all CS686 students) **must** submit a project proposal.
Textbooks, websites

- Textbook: David Poole and Alan Mackworth
  *Artificial Intelligence: Foundations of Computational Agents.*
  available online at artint.info

- Secondary textbooks:
  - Russell and Norvig
    *Artificial Intelligence* aima.cs.berkeley.edu/
  - Ian Goodfellow and Yoshua Bengio and Aaron Courville
    *Deep Learning* - deeplearningbook.org/

- Website: www.student.cs.uwaterloo.ca/~cs486

- Discussion forum and email: Piazza
  piazza.com/uwaterloo.ca/winter2019/cs486686/home

- assignments handed in and returned, grades, on LEARN
AccessAbility Services
Volunteer Notetaker Required

Interested? Complete an online application using your WATIAM:

https://york.accessiblelearning.com/UWaterloo/

More information:

Website: https://uwaterloo.ca/accessability-services/current-students/notetaking-services

Email: notetaking@uwaterloo.ca

Phone: 519-888-4567, ext. 35082
Current Research In A.I.

Organizations:
- Waterloo AI institute waterloo.ai
- Assoc. for the Advancement of A.I. (AAAI) aaai.org
- European Association for A.I. (EurAI) eurai.org
- Canadian A.I. Association caiac.ca
- Intl. Machine Learning Society machinelearning.org
- Association for Affective Computing (AAAC) emotion-research.net

Journals
- Artificial Intelligence
  journals.elsevier.com/artificial-intelligence/
- Journal of AI Research jair.org
- Journal of Machine Learning Research jmlr.org
- arXiv AI https://arxiv.org/list/cs.AI/recent

Conferences
- International Joint Conferences on A.I. ijcai-18.org
- AAAI 2018 aaai.org/Conferences/AAAI-18
- Neural Information Processing Systems nips.cc
- International Conf. on Machine Learning icml.cc
Overview of the Course

Lectures:

- **Introduction**
- **Agents and AI**
- **Representation and Reasoning**
  - States and Searching
  - Features and Constraints (CSPs)
  - Logical inference
  - Uncertainty
- **Learning and Planning**
  - Supervised learning
  - Unsupervised learning
  - Reinforcement learning
  - Machine Learning
  - Neural Networks and Deep Learning
  - Planning (with certainty and uncertainty)
- **Topics (time permitting)**
  - Affective (emotional) computing
  - Robotics
  - Natural Language Processing
What is Artificial Intelligence (AI)?
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The synthesis and analysis of computational agents that act intelligently.

An agent acts *intelligently* when

- what it does is appropriate for its circumstances and its goals, taking into account the short-term and long-term consequences of its actions
- it is flexible to changing environments and changing goals
- it learns from experience
- it makes appropriate choices given its perceptual and computational limitations
Next:

- What is AI? (Poole & Mackworth chapter 1.2-1.10, 2.1-2.3)
- Search (Poole & Mackworth chapter 3)