Lecture 1 - CS486 Introduction

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Readings: Poole & Mackworth 1.1

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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

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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.

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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

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Volunteer Note Taker Required

**AccessAbility Services Volunteer Notetaker Required**

Interested? Complete an online application using your WATIAM:

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

**More information:**

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

**Email:** notetaking@uwaterloo.ca

**Phone:** 519-888-4567, ext. 35082

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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 aai.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)?

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)