
CMPT310: Artificial Intelligence
Instructor: Greg Mori
Fall 2008 SYLLABUS

Overview

The goal of this course is to provide students with a survey of different aspects of artificial intelligence (AI). A variety of approaches with general applicability will be developed. We will start with the AI-as-search paradigm, and discuss generic search strategies and heuristic-based improvements. Logic, in particular first-order logic, will be presented as a formalism for representing knowledge in AI systems. The use of probability as a mechanism for handling uncertainty in AI will be presented, with a focus on Bayesian networks. Finally, we will explore the design of AI systems that use learning to improve their performance on a given task. In addition to these topics, specific domains such as computer vision, natural language processing, and robotics will be addressed.

Administrivia

Lectures: Tuesday 12:30-2:20, Thursday 12:30-1:20 in AQ3154

Greg's office hours: Wednesday 2:00-4:00 in TASC1 8007

TA: Hasti Seifi, hsa43 at sfu.ca

Hasti's office hours: TBA

Course website:

<http://www.cs.sfu.ca/~mori/courses/cmpt310>

Lecture Schedule (subject to change)

Sept. 2, 4: Administrivia, Introduction (Ch. 1)

Sept. 4: Intelligent Agents (Ch. 2)

Sept. 9: Uninformed Search (Ch. 3)

Sept. 11, 16: Informed Search, Local Search (Ch. 4)

Sept. 18, 23: Constraint Satisfaction Problems (Ch. 5)

Sept. 23, 25: Game Playing (Ch. 6)

Sept. 30: Logical Agents, Propositional Logic (Ch. 7)

Oct. 2, 7: First-order Logic (Ch. 8)

Oct. 9: Midterm review

Oct. 14: Midterm

Oct. 16: Robotics

Oct. 21: Reasoning under uncertainty (Ch. 13)

Oct. 23, 28: Bayesian networks (Ch. 14)

Oct. 30, Nov. 4: Temporal probability models: HMMs, DBNs, speech (Ch. 15)

Nov. 6: Learning (Ch. 18)

Nov. 11: No lecture (Rememberance Day)

Nov. 13, 18: Neural Networks (Ch. 20)

Nov. 20, 25: Decision Trees (Ch. 18)

Nov. 25: Utility theory (Ch. 16)

Nov. 27: Review for Final

Grading

Evaluation will be based on pair programming and individual written assignments, as well as midterm and final exams.

- 40% Assignments
- 20% Midterm
- 40% Final Exam

Students must attain an overall passing grade on the weighted average of exams in the course in order to obtain a clear pass (C or better).

Assignments

Assignment dates:

- A1 (written): Intelligent agents, search, 5% (out Sept. 9, due Sept. 23)
- A2 (programming): Game playing 7% (out Sept. 23, due Oct. 9)
- A3 (written): Logic 5% (out Oct. 2, due Oct. 23)
- A4 (written): Probability, probabilistic inference 5% (out Oct. 23, due Nov. 13)
- A5 (programming): Hidden Markov Models 11% (out Oct. 30, due Nov. 18)
- A6 (programming): Learning 7% (out Nov. 18, due Dec. 1)

Written assignments are to be done individually. For programming assignments, students may work in pairs.

Assignment 2 must be coded in Java. Assignments 5 and 6 may be coded in the programming language of your choice.

Late policy

Students will be permitted 4 grace days to use at their discretion over the semester. Late days are counted from the time an assignment is due, rounded up to the nearest whole day. For example, if an assignment is due on Friday at 3:30am, and is submitted on Saturday at 5pm, 2 grace days will have been used.

IMPORTANT: Other than the 4 grace days, late assignments will not be accepted, and will receive zero marks.

Textbooks

REQUIRED:

- Artificial Intelligence: A Modern Approach (2nd Edition), Stuart Russell, Peter Norvig, Prentice Hall, 2002.

REFERENCE:

- Computational Intelligence - A Logical Approach, David Poole et al, Oxford University Press.
- Artificial Intelligence (5th Edition). Structures and Strategies for Complex Problem Solving, George Luger, Addison Wesley.

Academic Honesty

Academic Honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty are subject to disciplinary action by the School; serious infractions are dealt with in accordance with the Code of Academic Honesty (T10.02) (<http://www.sfu.ca/policies/teaching/t10-02.htm>). Students are encouraged to read the School's policy information (<http://www.cs.sfu.ca/undergrad/Policies/>)