Overview

This course is an introduction to artificial intelligence. We will study the concepts that underlie intelligent systems. Topics covered include problem solving with search, adversarial games, knowledge representation and reasoning using propositional and first order logics, reasoning under uncertainty, introduction to machine learning, introduction to classical planning and reinforcement learning and a brief introduction to natural language processing.

Grading Policies

Evaluation: 5 written assignments, 4 programming assignments, 5 quizzes
Homework: 25%
Programming Assignments: 30%
Quizzes (4 best): 40%
Quality Class Participation: 5%

* Written assignments are due by 5pm on the due date. Late assignments will be penalized by 10% for each extra day after the due date.
* Solutions to written assignments will be posted at noon on the day before the respective Quiz. If you submit your homework after the solution is online, you will lose an additional 50% of your score.
* Programming assignments are due by midnight on the due date in Blackboard. Late assignments will be penalized by 10% for each
extra day after the due date.

* Collaboration policy:
  o You are welcome to discuss assignments with each other, with
    the TA, course assistants and with me, but do not copy
    solutions from any source.
    All submitted work must be solely the work of the people
    submitting them.
  o You can do all written and programming assignments in pairs
    (recommended!). If you pair up for an assignment then both
    individuals receive the same score.
  o Case Academic Integrity Policy
    <http://studentaffairs.case.edu/groups/aiboard/policy.html>

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Topics

*Part 1: Problem Solving With Search*
1. Introduction (Chapter 1)
2. Intelligent Agents and Uninformed Search (Chapter 2)
3. Informed Search (Chapter 3)
4. Search for Optimization (Chapter 4.1-2)
5. Adversarial Search (Chapter 5.1-5)

*Part 2: Logic and Automated Planning*
6. Propositional Logic and inference (Chapter 7)
7. First order logic and inference (Chapter 8.1-3, 9)
8. Automated Planning (Chapter 10.1-2, 10.4.2,10.4.4)

*Part 3: Probability and Machine Learning*
9. Basic Probability (Chapter 13)
10. Bayesian Networks (Chapter 14.1,2,4.1-4.2,5.1)
11. Machine Learning (Chapter 18.1-2)
12. Probabilistic Classification (Chapter 20.1-2)
13. Artificial Neural Networks (Chapter 18.7)

*Part 4: Decision Making under Uncertainty and NLP*
14. Sequential Decision Making (Chapter 17.1-3)
15. Reinforcement Learning (Chapter 21)
16. Natural Language Processing (Chapter 22)