CSCE 4201-001 Introduction to Artificial Intelligence

Introduction to concepts and ideas in artificial intelligence, including topics such as search techniques, adversarial search & games, knowledge representation, problem-solving, logic, probabilistic reasoning, machine learning, perception, natural language processing, robotics, and the future of artificial intelligence.

Required Text:

TOPICS
ARTIFICIAL INTELLIGENCE
  Introduction
  Intelligent Agents
PROBLEM SOLVING
  Solving Problems by Searching
  Beyond Classical Search
  Adversarial Search
  Constraint Satisfaction Problems
KNOWLEDGE AND REASONING*
  Extremely Brief Introduction to Logic and Knowledge Representation*
UNCERTAIN KNOWLEDGE AND REASONING*
  Extremely Brief Introduction to Uncertainty in AI*
MACHINE LEARNING
  Decision Trees
  Artificial Neural Networks
  Other ML Algorithms and Ensemble Learning
  Deep Learning
  Reinforcement Learning
COMMUNICATING, PERCEIVING AND ACTING
  Natural Language Processing
  Natural Language Communication
  Machine Vision
  Robotics
CONCLUSIONS
  The Future of AI

Final Exam: Thursday, May 7, 8:00am-10:00am, Room NTDP K150
ADA accommodation: UNT Policy 16.001: https://policy.unt.edu/policy/16-001
Academic Integrity Expectations: Do the right thing!
Per UNT Policy 06.003: https://policy.unt.edu/policy/06-003 consequences of violations could include course failure, or in some repeat cases, expulsion.

Learning Objectives:
1. Use and create programs that demonstrate understanding (including computational complexity) of search algorithms such as depth first, breadth first, iterative deepening, A*, Hill-climbing.

2. Implement programs that demonstrate understanding of two-person adversarial games (partially observable, stochastic, with state spaces too large to search).

3. Demonstrate basic understanding of logic and knowledge-based computational reasoning and probabilistic reasoning.

4. Utilize and demonstrate fundamental principles of machine learning algorithms and computational learning theory.

5. Use and create programs that show understanding of machine learning techniques.

6. Apply AI techniques in computational linguistics, machine vision and robotics.

Major Assignments:

*Midterms:* One or two midterm exams will assess your competency with regard to the learning objectives and topics covered from the beginning of the class.

*Final Exam:* A final exam will assess your competency with regard to the learning objectives and topics covered throughout the semester.

Grading:

- 10% Class participation (asking and answering thought provoking questions)
- 20% Homework assignments and quizzes
- 40% Exams (evenly split across 2-3 exams)
- 20% Project
- 10% Self Assessment

Under extraordinary circumstances, late assignments might be accepted for partial credit if negotiated in advance with the instructor.

Attendance is required and will be reflected as a component of the class participation grade.

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