

CSC 4444 - ARTIFICIAL INTELLIGENCE
FALL 2020: Fully Web-based course
Class Time: Monday and Wednesday 3:30pm to 4:50pm

Main Topics:

1. Introduction to AI (AIMA Chapters 1-2).
This will discuss the general issues such as "what is AI", the Turing Test, the history of AI, the applications of AI, the notion of an intelligent agent.
2. Problem Solving by search, and game playing (AIMA Chapters 3-5, and possibly 6)
This part includes the "state-space search" approach to solving problems. Various search algorithms will be covered. In particular the A-star search algorithm and the concept of heuristics is introduced. Game-playing as adversarial search is covered. Techniques such as minimax game-tree search, alpha-beta game-tree pruning are discussed.
3. Knowledge and reasoning: Logical Agents (AIMA Chapter 7)
This part we introduce representing knowledge using propositional logic. Methods of inference (reasoning) in propositional logic such as forward-chaining, backward-chaining, and resolution are discussed.
4. Handling Uncertainty, Probabilities and Bayesian Methods. (AIMA Chapters 12-13).
This part includes discussions of representing uncertainty with probabilities, inference with probabilities, Bayes Belief Networks (Bayes Nets).
5. Machine Learning (AIMA Chapter 19 and part of Chapter 21).
Several machine learning methods (decision trees, neural networks, Deep neural networks), will be discussed.
6. Natural Language Processing (AIMA Chapter 23, and possibly part of Chapter 24).
Topics in this part include language model (n-grams), grammar and parsing, natural language processing tasks. If time permitting, we may briefly cover deep learning application for NLP in Chapter 24.