CS4725/CS6705
Review information for midterm

Fall 2017

General information

- The midterm will be held on Wednesday, October 25, during our regular class time (12:30-1:20 pm).
- No books, notes, calculators or other aids will be allowed.
- Most questions will be similar to assignment questions (but with fewer steps since you will have limited time).

Some suggestions

- Use the lecture slides, your own course notes **and** the textbook to study.
- Review assignments, including the sample solutions.
- A sample midterm will be posted on Desire2Learn, but this is just a sample. Don't assume that your midterm will include exactly the same types of questions.
- Manage your time well.
  - Look through the whole midterm before starting.
  - Start with the questions you're sure you know how to do.
  - If you're really struggling with a question, don't spend too much time on it. Move on to something else and go back to the problematic one(s) later.

Chapter 1: Introduction

- Useful to re-read, just for some perspective
- However, you will not be tested on anything specific in Chapter 1.

Chapter 2: Intelligent Agents

- Definition of rational agents
- How to specify a task environment (PEAS description)
- Properties of task environments (fully observable vs. partially observable, deterministic vs. stochastic, etc.)

Chapter 3: Solving Problems by Searching

- Search problem formulation: states, initial state, actions, goal test, path cost
- Measuring problem-solving performance: completeness, optimality, time and space complexity
- Uninformed search strategies: BFS, uniform-cost, DFS, depth-limited search, IDS
- Avoiding repeated states (graph search)

Chapter 3 (continued)

- Informed search
  - Greedy best-first search
  - A*
- Heuristic functions
  - Admissibility
  - Consistency

Chapter 5: Adversarial search

- Minimax algorithm
- Alpha-beta pruning
  - If you need to use alpha-beta pruning, you will be provided with the algorithm. However, you should have a good understanding of the purpose of alpha-beta pruning and the general principles behind it. You should be able to look at a small game tree and determine where pruning could take place.
- Expectiminimax
- [Monte Carlo Tree Search will not be on the midterm.]

Chapter 4: Beyond Classical Search

- Local search will not be on the midterm.

Relevant textbook sections and assignments

- **1.1**, 1.2, 1.3, 1.4
- **2.1, 2.2, 2.3**, 2.4
- **3.1, 3.2, 3.3, 3.4, 3.5, 3.6**
- **5.1, 5.2, 5.3**, 5.4, **5.5**

- Assignments 1 and 2
- Labs 1 and 2