

Midterm Exam – EECE 216 Artificial Intelligence

Instructions

First be sure to write your name, initials, and MU ID number in the places provided. Next please check to make sure this exam has all the pages.

The exam consists of 10 problems worth 20 points each for a total of 200 possible points. Remember smart test taking.

1. Don't waste time on a problem you get stuck on. Try other problems and come back.
2. Show your work. Even if your answer is wrong you'll get credit for correctly attacking the problem. And even if your answer is correct you'll lose points for not showing your work.
3. Read all questions carefully to be sure you know what is being asked.

The exam is open book, but closed notes, and closed calculator. The only objects on your desk should be this exam, a writing instrument, and your text book. Put your book bag and other belongings along the front wall. Sit only in a seat with an exam.

You have the full 75 minutes to complete the exam. Be sure to show all work so I can give partial credit where applicable.

Good Luck!

Name: _____ MU ID #: _____

Initials: _____

1. (20 points) In 1950, Turing proposed a test for intelligence. Describe the test. What objections to this test did Turing discuss in his paper? Propose some other objections in addition to Turing's own objections.

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2. (20 points) Provide definitions from each of the perspectives of Artificial Intelligence (AI) discussed in class. Evaluate the definitions of AI you have provided.

Initials: _____

3. (20 points) You are a test-taking agent for AI exams. Describe the PEAS for yourself and describe your environment.

Initials: _____

4. (20 points) Formulate the game of chess as a search problem.

Initials: _____

5. (20 points) Evaluate and compare the minmax and alpha-beta algorithms.

Initials: _____

6. (20 points) Using commonly employed criteria in this field, evaluate the following search strategies: breadth-first, uniform-cost, iterative deepening, greedy, A*, hill-climbing, and genetic algorithm. Additionally, classify the search strategies in an appropriate manner.

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7. (20 points) Give first-order logic that preserves the intended meaning in English of the following sentences. Say whether each translation is valid, satisfiable, or invalid.
- One more outburst like that and you'll be in contempt of court.
 - Well, I like Sandy and I don't like Sandy.
 - If you lived here you would be home now. If you were home now, you would not be here. Therefore, if you lived here you would not be here.
 - Maybe I'll come to the party and maybe I won't.

8. (20 points) Using resolution, determine if B is true given the following entries in the knowledge base:

$$A \Rightarrow B$$

$$C \wedge D \Rightarrow A$$

$$F$$

$$F \wedge A \Rightarrow C$$

$$F \wedge E \Rightarrow C$$

$$E$$

$$E \wedge C \Rightarrow D$$

Initials: _____

9. (20 points) For this problem, refer to Figure 3.2 in the book. The goal is to find a path from Lugoj to Fagaras. Draw the search trees for breadth-first and depth-first searches. Number the nodes on the tree in the order they were explored.

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10. (20 points) For this problem, refer to Figures 3.2 and 4.1 in the book. The goal is to find a path from Lugoj to Fagaras. Draw the search trees for greedy and A* searches. Use a straight line distance heuristic. Number the nodes on the tree in the order they were explored.

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