COSC 4368 (Spring 2020)

Review List Midterm1 Exam on Monday, March 2, 1-2:15p

The Midterm1 is scheduled for March 2 at 1p in our classroom. The exam will take 75 minutes and is open-books and notes and, but friends and other human beings are not permitted and, more importantly, **the use of computers and cell phones is not permitted!**

Relevant slide shows, pasted from the COSC 4368 Website that are relevant for the midterm exam:

Search

* [Search1](http://www2.cs.uh.edu/~ceick/ai/search1.pptx) (Classification of Search Problems, Terminology, and Overview ), [Search2](http://www2.cs.uh.edu/~ceick/ai/search2.pptx) (Problem Solving Agents), [Search3](http://www2.cs.uh.edu/~ceick/ai/search3.pptx) (Heuristic Search and Exploration), [Search4](http://www2.cs.uh.edu/~ceick/ai/search4.pptx) (Randomized Hill Climbing and Backtracking; not covered in textbook), [Search8](http://www2.cs.uh.edu/~ceick/ai/backtracking.pdf) (Kamil on Backtracking), [Search5](http://www2.cs.uh.edu/~ceick/ai/russel5.pdf) (Games; Russel transparencies for Chapter 6; will cover transparencies 1-29, excluding those that cover games) [Search6](http://www2.cs.uh.edu/~ceick/ai/russel6.pdf) (Russel slides Constraint Satisfaction Problems (CSP); we will cover slides 1-26, 32-37, and 41), [Search7](http://www2.cs.uh.edu/~ceick/ai/search7.pptx)

Midterm1 will only ask very basic question about games (Search5) and there will be nothing in the exam about card games. You should know the following approaches algorithms well: Best-first search, A\*, randomized and classical hill climbing, simulated annealing, backtracking in general (Search8) and using backtracking and local search for constraint satisfaction problems.

Reinforcement Learning, Neural Networks, and Machine Learning in General

* [A Gentle Introduction to Machine Learning](http://www2.cs.uh.edu/~ceick/ai/4368-ML-Intro.pptx)
* Reinforcement Learning: [RL1](http://www2.cs.uh.edu/~ceick/ai/RL1.pptx) (Introduction to Reinforcement Learning),),
* Neural Networks: [NN1](https://www.bing.com/videos/search?q=neural+network+video&view=detail&mid=54402D363ABB8903202F54402D363ABB8903202F&FORM=VIRE) ([3blue1brown](https://www.3blue1brown.com/): *What is a Neural Network?* (will show the first 12:30 of this video)), [NN2](http://www2.cs.uh.edu/~ceick/ai/NN2019.pptx) (Dr. Eick's NN slides)

Midterm1 will only ask very basic question about neural networks and the “Gentle Introduction” to ML; you should have, on the other hand, in-depth knowledge about the objectives and methods of RL, role of exploration, know what policies, Bellman Equations, Temporal difference learning, Q-Learning, and SARSA; you should be able to provide the Bellman equations for an example and should be able to apply temporal difference learning for an example world.

Tentative weights of topics in MT1: Search 50-55%, Reinforcement Learning 35-45%, Neural Networks 5-10%. The exam is designed to be slightly too long; you are assumed to solve about 90% of the exam problems.

Relevant material from the Russel textbook (Third Edition):

Chapter 3: pages 64-108; Chapter 4: 120-126 Chapter 5: 161-180 (the discussion of card games is not relevant), Chapter 6: 202-222, Chapter 17: 645-656 Chapter 18: 727-736 Chapter 21: 830-831, 836-845 853.

Material that was discussed in class that is relevant for the midterm exam (but not necessarily is discussed in the textbook): Simulated Annealing, traditional Hill Climbing and Randomized Hill Climbing, Backtracking (Search 8).

The material discussed on the first week will be covered in the final exam and not Midterm2.

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