COSC 4368 (Spring 2020)

Final Version

Review List Final Exam on Monday, May 4, 2020, 2p

The 4368 final exam will take 75-95 minutes and is open-books and notes.

Relevant slide shows, articles and videos, pasted from the COSC 4368 Website which are relevant for the final exam.

China’s AI Strategy:

* <https://www.cnas.org/publications/reports/understanding-chinas-ai-strategy> (please read; will only ask questions about the introduction, and items 1, 2, 7, 8, 16, and Conclusion)
* [AI's Impact on Society](https://www.bing.com/videos/search?q=Artificial+Intelligence+and+Society+videos&&view=detail&mid=7E16A38F386DE9777AF67E16A38F386DE9777AF6&&FORM=VRDGAR&ru=%2Fvideos%2Fsearch%3Fq%3DArtificial%2520Intelligence%2520and%2520Society%2520videos%26qs%3Dn%26form%3DQBVR%26sp%3D-1%26pq%3Dartificial%2520intelligence%2520and%2520society%2520videos%26sc%3D0-42%26sk%3D%26cvid%3D3717327387ED4998B76CFD197058097B) (watch video starting at 28:00 Chinese AI until topic changes)

2021 Machine Learning Transparencies:

* [Introduction to Supervised Learning](http://www2.cs.uh.edu/~ceick/ai/Eick_SL.pptx) (also called "Learning from Examples")
* 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/NN2.pptx) (Dr. Eick's NN slides), [NN3](http://www2.cs.uh.edu/~ceick/ai/russel20.pdf) (Russel's Introduction to Neural Networks, not covered in the lecture, but you might take a look at it).
* [Support Vector Machines](http://www2.cs.uh.edu/~ceick/ai/SVM.pptx) ([Review of the SVM lecture](http://www2.cs.uh.edu/~ceick/ai/SVM-Review.docx); added on March 24, 2020).

2021 Decision Making and Reasoning in Uncertain Environment Transparencies

* [Review Probability Theory](http://www2.cs.uh.edu/~ceick/ai/Probability-Review.pptx)
* [Bayes' Theorem"](http://www2.cs.uh.edu/~ceick/ai/bayes.pdf) and [Naive Bayes Classifiers](http://www2.cs.uh.edu/~ceick/ai/NBC.pptx) ([Wikipedia NBC Reading Material](https://en.wikipedia.org/wiki/Naive_Bayes_classifier))
* UC Berkeley's [Introduction to Belief Networks](http://www2.cs.uh.edu/~ceick/ai/BBN0.pptx) (to be covered in lecture) and Dr. Eick's [Computations in Belief Networks](http://www2.cs.uh.edu/~ceick/ai/Bbn.pptx) (to be covered in the lecture) Transparencies
* 2021 Hidden Markov Models Transparencies ( [Daphne Koller's Introduction to Hidden Markov Models Video](https://www.youtube.com/watch?v=mNSQ-prhgsw), [Dr. Eick's Hidden Markov Model Slides](http://www2.cs.uh.edu/~ceick/ai/HMM.pptx), )

2021 Teaching Material Evolutionary Computing (**EC**): EC1: [Introduction to Evolutionary Computing](http://www2.cs.uh.edu/~ceick/ai/EC1.pptx) and EC2:[Example: Using EC to Solve Travelling Salesman Problems](http://www2.cs.uh.edu/~ceick/ai/EC2.pptx), [Eiben-Smith Introduction to EA](http://www2.cs.uh.edu/~ceick/ai/Eiben-Smith-EC.pdf) (they call 'EC': 'EA'! just read pages 1-13 of the article), [April 6 EA-paper Walkthrough Notes](http://www2.cs.uh.edu/~ceick/ai/EA-Walkthrough-Notes.docx) (was not covered in 2021 but might be worthwhile to read) The exam ill only ask very basic questions about EC!

2021 Deep Learning ([Convolutional Neural Networks (CNN) (](http://www2.cs.uh.edu/~ceick/ai/CNN.pptx)[CNN Article](https://cs231n.github.io/convolutional-networks/?fbclid=IwAR3mPWaxIpos6lS3zDHUrL8C1h9ZrzBMUIk5J4PHRbKRfncqgUBYtJEKATA) (might ask questions about this article), Generative Adversarial Networks (GANs) ([Introductory GAN Article](http://www2.cs.uh.edu/~ceick/ai/GAN_Intro.pdf)(only pages 1-4 and 7 are relevant for the exam; if we ask questions about this article it will be very basic questions, but most likely we will ask questions about Task5!)

2021 Societal and Ethical Issues of AI

* [Human Do not Need to Apply](https://www.youtube.com/watch?v=7Pq-S557XQU&feature=youtu.be) (a video that analyzes the influence of AI on jobs)
* [Ethics for AI](https://www.bing.com/videos/search?q=ethics+for+ai+video&view=detail&mid=40EB460FED93E484CA8740EB460FED93E484CA87&FORM=VIRE) (short video, motivating the need for ethics for AI and what problems it needs to address)
* [AI's Impact on Society](https://www.bing.com/videos/search?q=Artificial+Intelligence+and+Society+videos&&view=detail&mid=7E16A38F386DE9777AF67E16A38F386DE9777AF6&&FORM=VRDGAR&ru=%2Fvideos%2Fsearch%3Fq%3DArtificial%2520Intelligence%2520and%2520Society%2520videos%26qs%3Dn%26form%3DQBVR%26sp%3D-1%26pq%3Dartificial%2520intelligence%2520and%2520society%2520videos%26sc%3D0-42%26sk%3D%26cvid%3D3717327387ED4998B76CFD197058097B) (watch starting 12:19 centering on fake news and then skip to 28:00 Chinese AI )
* [Discussion Questions about some of the shown videos](http://www2.cs.uh.edu/~ceick/ai/Ethics%20for%20AI.pptx)
* EU Article (see below)

Composition of the exam: TBDL

**Additional Reading Material** (please read!)**:**

<https://www.cnas.org/publications/reports/understanding-chinas-ai-strategy> (please read; will only ask questions about the introduction, and items 1, 2, 7, 8, 16, and Conclusion)

SVM Wikipedia Page: <https://en.wikipedia.org/wiki/Support-vector_machine>

Eiben-Smith EC Article [book.dvi (uh.edu)](http://www2.cs.uh.edu/~ceick/ai/Eiben-Smith-EC.pdf)

<https://en.wikipedia.org/wiki/Naive_Bayes_classifier>

[CNN Article](https://cs231n.github.io/convolutional-networks/?fbclid=IwAR3mPWaxIpos6lS3zDHUrL8C1h9ZrzBMUIk5J4PHRbKRfncqgUBYtJEKATA)

<https://en.wikipedia.org/wiki/Hidden_Markov_model>

[Forward algorithm - Wikipedia](https://en.wikipedia.org/wiki/Forward_algorithm) (a different more linear algebra based description on how to to compute αr(s))

(Wikipedia HMM page; might use the weather/activity HMM in the final exam)

[EuropeAIEthicsGuidelines.pdf (uh.edu)](http://www2.cs.uh.edu/~ceick/ai/EuropeAIEthicsGuidelines.pdf) (only pages 11-13 starting with 2.2 “Ethical Principles” and pages 14-22 (2.2 non-technical methods is not relevant) are relevant for the exam! I strongly recommend that you read these pages before the exam!

Relevant material from the Russel textbook (Fourth Edition)

Chapter 12: 397-403

Chapter 13: 413-416, 427-430

Chapter 14: 510-517, 522-524

Chapter 15: also discusses Hidden Markov Models, but the lecture slides and the Wikedia pages in the reading material should give you enough details for the exam.

Chapter 19: 651-655, 692-696

Chapter 21: 750-756, 760-763 (not covered in the third edition)

I suggest you use the 4th edition; if not available here are some pages in the 3rd edition.

 Relevant material from the Russel textbook (Third Edition)

Chapter 13: 495-499

Chapter 14: 510-517, 522-524

Chapter 15: also discusses Hidden Markov Models, but the lecture slides and the Wikedia pages in the reading material should give you enough details for the exam.

Chapter 18: 695-697 727-737 744-748

.