Dr. Christoph F. Eick

Review List Midterm2 Exam DS 1 COSC 3337

Thursday, November 3, 11:30a-12:45p

Last updated: October 31, 4p

Class rooms: students whose last name starts A-J take the exam in CEMO 101 and students whose last name starts K-Z take the exam in room CBB 124.

The exam will be “open books and notes” (but use of computers & internet is **not** allowed) and will center on the following topics (at least 85% of the questions will focus on material that was covered in the lecture); bringing calculators is okay. There will be no programming in this exam.

1. \* General Topics for Classification, particularly overfitting and model performance evaluation.
2. \*\*\*\*\* Neural networks (class transparencies, textbook pages 249-262); content of the  two introductory videos by 3blueonebrown about neural networks:  
   [Introduction to Neural Networks](https://www.bing.com/videos/search?q=neural+network+video&view=detail&mid=54402D363ABB8903202F54402D363ABB8903202F&FORM=VIRE) (watch the whole video)  
   [Weight Learning in Neural Networks](https://www.youtube.com/watch?v=IHZwWFHWa-w&list=PLZHQObOWTQDNU6R1_67000Dx_ZCJB-3pi&index=3&t=0s) (just watch the first 15 minutes of the second video)
3. \*\*\* RNN (lecture slides and the following article: [Colah's Blog: Understanding LSTMs](http://www2.cs.uh.edu/~ceick/UDM/Understanding_RNN.pdf))
4. \*\*\*\* Density Estimation (Lecture Slides which discuss naïve and parametric Density Estimation.
5. \*\*\* Similarity Assessment (you should know how to design a distance function)
6. \*\*\*\*\*\*\* Clustering (you should have in depth knowledge of K-Means, PAM/k-medoids, Hierarchical Clustering, DBSCAN; lecture slides which introduced these algorithms)

Other relevant material: Group Homework Credit Slides of Presentations that covered the above topics.

Relevant Lecture Slides:

[Neural Networks](http://www2.cs.uh.edu/~ceick/UDM/NN2022.pptx), [Recurrent Neural Networks](http://www2.cs.uh.edu/~ceick/UDM/RNN.pptx), [Colah's Blog: Understanding LSTMs](http://www2.cs.uh.edu/~ceick/UDM/Understanding_RNN.pdf),

V Density Estimation ([Naive and Parametric Density Estimation](http://www2.cs.uh.edu/~ceick/UDM/PDE.pptx), [Non-parametric Density Estimation](http://www2.cs.uh.edu/~ceick/UDM/NPDE.pptx))  
VI Clustering and Similarity Assessment ([Introduction](http://www2.cs.uh.edu/~ceick/UDM/DS1_clustering1.pptx), [Density-based Clustering Centering on DBSCAN](http://www2.cs.uh.edu/~ceick/UDM/dm_clustering2.pptx), [Hierarchical Clustering](http://www2.cs.uh.edu/~ceick/UDM/DS1_HC.pptx), )