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**College of Natural Sciences & Mathematics http://nsm.uh.edu**

**COURSE TITLE/SECTION**: Advanced Machine Learning (COSC 7362)

**TIME: MW 1-2:30p in 204 AH**

**FACULTY: Christoph F. Eick OFFICE HOURS**: Mo 3:15-4:45p We: 2:30-3p

**E-mail: ceick@uh.edu Phone: 33345 (use e-mail!!)**

**Course Advanced *Machine Learning (COSC 7362)[[1]](#footnote-1)***

**A. Catalog Description**

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**B. Purpose**

Machine Learning is the study of how to build computer systems that learn from experience. It intersects with statistics, cognitive science, information theory, artificial intelligence, pattern recognition and probability theory, among others.

In Fall 2015 the course will cover the following subfields of machine learning:

1. Anomaly and Outlier Detection
2. Density Estimation and Model-based Approaches to Machine Learning
3. Deep Learning
4. Ensemble Learning
5. Spatial Temporal Clustering

In the Fall 2015 offering of Advanced Machine Learning we will read, summarize, and discuss papers in previously mentioned subfields using two forms:

1. paper walkthroughs (we will slowly go through a few papers when the class meets, paragraph by paragraph)
2. student presentations

Moreover, about 20% of the course will center on covering basic research skills such as

a. how to read a (machine learning) paper

b. how to write an abstract (of a machine learning paper)

c. how to review a (machine learning) paper

d. how to conduct a (machine learning) research project

e. how to perform an experimental (machine learning) study

 There will be also about 7-10 survey-style lectures by the instructor and about 20% of the lecture time will be allocated to discussions of machine learning papers, machine learning in general, and of machine learning methodology and to answering student questions.

**II. Course Objectives**

Upon completion of this course, students

1. will know what the goals and objectives of machine learning are
2. will know how to read, understand, summarize, evaluate machine learning papers
3. will have sound knowledge of particular subfields of machine learning, namely Anomaly and Outlier Detection, Deep Learning, Density Estimation, Ensemble Learning, and Spatial-Temporal Clustering
4. will learn the main ingredients to conduct a machine learning project successfully
5. will learn how to make presentations and to lead discussions

**III. Course Content**

1. Goals and Objectives of Machine Learning
2. Anomaly and Outlier Detection
3. Density Estimation & Model-based Approaches to Machine Learning
4. Deep Learning
5. Machine Learning Research Methodology
6. Ensemble Learning
7. Spatial-Temporal Clustering
8. How to Read, Understand, Summarize, and Evaluate Machine Learning Papers with Practical Exercises

**IV. Course Structure**

7-10 lectures

2 Quizzes

4-5 Paper Walkthroughs

8-12 Student Presentations

2-3 Discussions

2 Homeworks

**V. Textbooks**

No textbook will be used; about 13-17 machine learning research and survey papers will be covered in the course.

**VII. Evaluation and Grading**

2 Quizzes: 40%   
Student presentations and Leading Course Discussions: 28%  
Homeworks: 17%

Class Participation: 15%

Remark: These percentages are preliminary and subject to change.

Translation number to letter grades:  
A:100-90 A-:90-86 B+:86-82 B:82-77 B-:77-74 C+:74-70  
C: 70-66 C-:66-62 D+:62-58 D:58-54 D-:54-50 F: 50-0

**Policy on grades of I (Incomplete):** A grade of ‘I’ will only be given in extreme emergency situations and only if the student completed more than 2/3 of the course work.

**VIII. Consultation**

Instructor: [Dr. Christoph F. Eick](http://www.cs.uh.edu/~ceick/ceick.html)

office hours (573 PGH): M 3:15-4:45p W 2:30-3p

e-mail: ceick@.uh.edu

**Addendum:** Whenever possible, and in accordance with 504/ADA guidelines, the University of Houston will attempt to provide reasonable academic accommodations to students who request and require them. Please call 713-743-5400 for more assistance.

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| Row 1 | 1358284 | -,Kajol | NSM Graduate -  Computer Science, MS |
| Row 2 | 0832127 | Aroua,Nesrine | Engineering Graduate -  Biomedical Engineering, MSBE |
| Row 3 | 1228454 | Dunbar,Arthur P | NSM Graduate -  Computer Science, MS |
| Row 4 | 1323547 | Jiang,Tianxiao | Engineering Graduate -  Biomedical Engineering, PHD |
| Row 5 | 1295838 | Khalil,Nacer | NSM Graduate -  Computer Science, PHD |
| Row 6 | 1344084 | Le,Ha Anh Vu | NSM Graduate -  Computer Science, PHD |
| Row 7 | 1358079 | Lnu,Shruti Ray | Engineering Graduate -  Biomedical Engineering, MSBE |
| Row 8 | 1329834 | Parmar,Kunal J | NSM Graduate -  Computer Science, MS |
| Row 9 | 1365010 | Patil,Pramey Prakash | NSM Graduate -  Computer Science, MS |
| Row 10 | 1353607 | Pham,Nguyen D | NSM Graduate -  Computer Science, PHD |
| Row 11 | 1392654 | Sarafianos,Nikolaos | NSM Graduate -  Computer Science, PHD |
| Row 12 | 1354349 | Settipalli,Anjani Swetha | NSM Graduate -  Computer Science, MS |
| Row 13 | 1361158 | Yan,Lifeng | Engineering Graduate -  Electrical Engr, PHD |
| Row 14 | 1269577 | Zhang,Yongli | NSM Graduate -  Computer Science, PHD |

1. This is only the preliminary draft of the course syllabus; the final version of the course syllabus of the course will be posted on the course website which should be up on August 29, 2015 or earlier. [↑](#footnote-ref-1)