CS 6900: Deep Learning  
Fall 2014

Class Meetings: Mon, Wed, Fri 10:45–11:40am, ARC 121  
Instructor: Razvan Bunescu  
Office: Stocker 341  
Office Hours: Wed, Fri 2:00–3:00pm, or by email appointment  
Email: bunescu @ ohio.edu  
Class Website: http://ace.cs.ohio.edu/~razvan/courses/dl6900

Prerequisites:  
Previous exposure to machine learning will be very useful, though not strictly necessary. The students are expected to be comfortable with programming and familiar with basic concepts in linear algebra and statistics.

Textbook:  
There is no textbook for this course. Links to online reading materials will be made available on the course web page.

Recommended Reading:  
Machine Learning course web site:  
http://ace.cs.ohio.edu/~razvan/courses/ml6900

Course Description:  
This course will introduce a number of approaches for the unsupervised learning of feature representations. Basic features, such as edge detectors in computer vision, will be induced automatically from unlabeled data using sparse autoencoders and then assembled into increasingly more complex feature representations by greedy layering in deep learning architectures. Recently, these learning from scratch approaches have been shown to obtain state-of-the-art performance on a wide array of tasks in computer vision, speech recognition, and natural language processing. The lectures will cover the theoretical aspects of unsupervised feature learning models, whereas homework assignments will give students the opportunity to build and experiment with shallow and deep learning models, for which skeleton code will be provided.

Proposed Topics:  
Logistic and Softmax Regression, Feed-Forward Neural Networks, Backpropagation, Sparse Autoencoders, Vectorization, PCA and Whitening, Self-Taught Learning, Deep Networks, Linear Decoders, Convolution and Pooling, Sparse Coding, Independent Component Analysis, Canonical Correlation Analysis.
Grading:
40%: Homework Assignments
30%: 2 Midterm Exams (Oct 6 and Dec 1, in class)
30%: Final Project

Important Dates:
Monday, Sep. 1: Labor Day, no class.
Friday, Oct. 3: Reading Day, no class.
Friday, Oct. 31: Last day to drop class.
Friday, Nov. 7: EECS faculty retreat, no class.
Wednesday, Nov. 26: Thanksgiving break, no class.
Friday, Nov. 28: Thanksgiving break, no class.
Friday, Dec. 5: Last day of this class.

Course and Attendance policies:
Assignments: All homework assignments are due before the class. No late submissions will be accepted without prior approval.
Attendance: It is in your best interest to attend all the lectures. Some of the material will not be found in the reading materials. Extra credit will be awarded for class activity. Also, be sure to check your OU email for important announcements on a regular basis.

Academic Dishonesty Policy:
All work must be the student’s own. All external references used in reports must be properly cited. No credit will be given for duplicate or plagiarized work. Additional measures may be imposed by the Office of Community Standards and Student Responsibility, when conditions warrant. Students may appeal academic sanctions through the grade appeal process. The OU Student Code of Conduct Policy is available online at:
http://www.ohio.edu/communitystandards/academic/students.cfm

Disability-based Accommodation:
Any student who suspects s/he may need an accommodation based on the impact of a disability should contact the class instructor privately to discuss the students specific needs and provide written documentation from the Office of Student Accessibility Services. If the student is not yet registered as a student with a disability, s/he should contact the Office of Student Accessibility Services.

Other Policies:
Be sure to notify the professor of any exam conflicts or other extenuating circumstances well in advance. No missed exams will be made up without prior approval.