CEng 783 – Deep Learning

Fall 2019 – Week 1

Misc. info about the class

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• Course webpage: http://bit.do/ceng783
• Syllabus: link
Prerequisites

- Foundational knowledge in machine learning.
- Elementary calculus. Linear algebra.
- Proficiency in Python.
Machine Learning Background Test

How familiar are you with the following:

• Train set, test set, validation set
• Supervised learning, unsupervised learning
• SVM, logistic regression
• Bias/Variance trade-off
• Underfitting, overfitting
• Regularization (L1, L2)
• Hyper parameter
• Basic numerical optimization, gradient descent
• Capacity of a model
• VC dimension
• Generative model, Discriminative model
• ...

Grading

- Two homework assignments: 25%
- Midterm exam: 30%
- Project: 45%
2 assignments

1\textsuperscript{st}: Machine learning background and basics
2\textsuperscript{nd}: Multilayer perceptrons and Convolutional Neural Networks
Assignment 1 (HW1)

It will be available today.

Part 1 [90 pts] Implementation, training and testing of a classifier

In this part, you are required to

- implement,
- train,
- test and
- report the performance of

a custom two-class classification method. We are going to call this method the short.

Part 2 [10 pts] Understanding cross-validation
Assignment 1 (HW1)

• It will be available today.
• This is a good test of your machine learning background.
• Pl check the website of the course.
• It is due in 12 days (Oct 6)
• The policy for late submission is on the webpage of the class.
Midterm exam 30%

Machine learning background

ANNs (perceptron, MLPs)

CNNs, RNNs, backpropagation, optimization, etc.
Reading assignments

• Will not be graded, they are to aid your learning
• Parts from the textbook(s)
• Relevant papers
• Reading assignment for next week:


http://www.deeplearningbook.org/contents/ml.html
Project

• Start thinking about your project. It could be related to your graduate research.
• **45%** of your grade.
• It should have the potential to result in a research paper.
• Encouraged to be done in pairs.
• Proposals expected in the 5th week.
Theory is good but what about practice?

We will use Pytorch for practical tasks
• Examples, small workshops in class
• Homeworks
If you would like to take the class, please fill in the following form:

http://bit.do/ceng783form
- Name, METU id, email address
- School, department
- Program: undergraduate, MS, PhD
- Year in current program
- Machine learning background (previous courses, projects)
- Thesis topic
- Research advisor
- Why do you want to take 783? (max 3 sentences)