CMPE597.01
Deep Learning
Spring 2019

NOTE: Students who would like to register need to send a consent message via registration.boun.edu.tr describing their machine learning background (list relevant courses if any), and briefly explain their motivation (e.g. 'I would like to use deep learning to predict lung cancer or to compose music'). Adding a rough idea for the term project also helps.

INSTRUCTOR: Pinar Yanardag
E-mail: yanardag.pinar@gmail.com, Web: http://www.mit.edu/~pinary

CLASS TIME: Mondays 1-4PM, BM A5 (The first class will be on Feb 18th, 2019.)

COURSE OBJECTIVES: This course will provide an introduction to Deep Learning, however medium level knowledge of machine learning is expected. We will discuss essential deep learning methods (as well as some advanced deep learning algorithms) for the first 4-5 weeks of the class. After that, students are expected to present a paper relevant to their research (e.g. deep learning in bioinformatics, deep learning in computer vision, …). The last 1/3 of the class will focus on the term projects.

PRE-REQUISITES: Students are expected to have a medium level knowledge of essential machine learning algorithms. Undergrads and grad students who are new to machine learning are encouraged to take **CMPE462: Machine Learning** course.

TENTATIVE LIST OF TOPICS:
- Introduction to Neural Networks
- Convolutional Neural Networks
- Training Neural Networks (activation functions, dropout, batch normalization)
- Word Embeddings
- Recurrent Neural Networks (RNNs, LSTMs, GRUs)
- Visualizing and Understanding Neural Networks (Deep Dream, Neural Style Transfer)
- Generative Models
- Advanced Deep Learning Models

TEXTBOOKS (OPTIONAL):
- Deep Learning, MIT Press, Ian Goodfellow and Yoshua Bengio and Aaron Courville https://www.deeplearningbook.org
- Deep Learning with Python, François Chollet https://www.manning.com/books/deep-learning-with-python?a_aid=keras&a_bid=76564dff

COURSE WEB SITE: We will use the **Moodle** for lecture notes, announcements, grades, and project submissions: http://moodle.boun.edu.tr, and **Piazza** for discussions related to homeworks and questions.

GRADING:
3 Assignments: 30% , 1 in-class Exam: 20%, Term Project: 40%, Paper presentation: 10%, (Bonus) Piazza participation: 5% (for the top 10 active students)