Instructor: Andrew Ng  
Teaching Assistants: Younes Bensouda Mourri, Paul Magon de La Villehuchet

Course Description: You will learn to implement and apply machine learning algorithms. This course emphasizes practical skills, and focuses on giving you skills to make these algorithms work. You will learn about commonly used learning techniques including supervised learning algorithms (logistic regression, linear regression, SVM, neural networks/deep learning), unsupervised learning algorithms (k-means), as well as learn about specific applications such as anomaly detection and building recommender systems. This class is taught in the flipped-classroom format. You will watch videos and complete in-depth programming assignments and online quizzes at home, then come to class for discussion sections. This class will culminate in an open-ended final project, which the teaching team will help you on.

Prerequisites: Programming at the level of CS106B or 106X, and basic linear algebra such as Math 51.

Grade Breakdown:
- Problem Sets: 20%
- Programming Assignments: 20%
- Quizzes: 10%
- Attendance: 5% (you are allowed to miss one class)
- Midterm: 20%
- Project: 25%

Final Project Presentation: December 12th, 2018 (3:30-6:30 pm - location TBD)

Office hours (Huang Basement):
- TBD

Session 1: Monday September 24th, 2018  
Content: Overview of machine learning and models  
Homework: Week 1 & 2 on Coursera for next class:  
  - Quizzes: Introduction, Linear regression with one variable, Linear algebra, Linear regression with multiple variables, Octave/Matlab tutorial.  
  - Programming Assignments: Linear regression (both assignments including optional)

Session 2: Monday October 1st, 2018  
Content: Linear regression  
Homework: Week 3 on Coursera for next class:  
  - Quizzes: Logistic regression/Regularization  
  - Programming Assignments: Logistic regression

Session 3: Monday October 8th, 2018  
Content: Logistic regression and Regularization  
Homework: Week 4 on Coursera for next class:  
  - Quizzes: Neural networks  
  - Programming Assignments: Multi class classification and neural networks  
  - Problem Set 1

Session 4: Monday October 15th, 2018  
Content: Neural Networks
Homework: Week 5 on Coursera for next class
- Quizzes: Neural network learning
- Programming Assignment: Neural network learning
- Project Proposal.

Session 5: Monday October 22nd, 2018
Content: Neural networks
Homework: Week 6 on Coursera for next class:
- Quizzes: Advice for applying machine learning, Machine learning system design
- Programming Assignments: Regularized linear regression and bias/variance
- Problem Set 2

Session 6: Monday October 29th, 2018
Content: Bias/Variance
Homework: Week 7, 8 on Coursera for next class:
- Quizzes: Support Vector Machines, Unsupervised learning, Principal Component Analysis
- Programming Assignments: Support Vector Machines, K-means clustering and PCA.

Session 7: Monday November 5th, 2018
Content: Advice on ML systems
Homework:
- Prepare for the midterm.
- Problem Set 3

Session 8: Monday November 12th, 2018 - Midterm in class.
Content: Support Vector Machines, Principal Component Analysis, K-Means Clustering
Homework: Week 9 on Coursera for next class.
- Quizzes: Anomaly Detection, Recommender Systems (due Sunday Nov.25th)
- Programming Assignments: Anomaly Detection, Recommender Systems (due Sunday Nov.25th)
- Project Milestone: Write up. Follow the guidelines in the worksheet. ~ (due Monday Nov.19th)

Session 9: Monday November 26th, 2018
Content: Anomaly Detection, Recommender Systems
Homework: Week 10,11 on Coursera for next class:
- Quizzes: Large scale machine learning, application photo OCR
- Problem Set 4

Session 10: Monday December 3rd, 2018
Content: When to use what algorithm? Given a situation, choose a model.
Homework: Work on final Project

Each Session will be held in either Y2E2 111, Herrin T195, Thornt 110 at the same time. (Mondays 1:30-2:50 pm). We will assign you to a section this week.

All homeworks are due on Sunday At Midnight.