

CS 6140: Machine Learning

Spring 2017

Location: Tuesdays 11:45 - 1:25am and Thursdays 2:50 - 4:30pm, Robinson Hall 109

Instructor: Olga Vitek, WVH 310F, o.vitek@neu.edu
Office hours Tuesdays 1:30-2:30pm, or by appointment.

Tecahing assistant: Sara Taheri, WVH 310 mohammadtaheri.s@husky.neu.edu
Office hours Tuesdays 10:00-11:00am, or by appointment

Goals of the course: Supervised machine learning is the study and design of algorithms that enables computers/machines to learn from experience or data, given examples of data with a known outcome of interest. This course is an introduction to supervised machine learning. It provides a broad view of models and algorithms for supervised decision making. The course discusses the methodological foundations behind the models and the algorithms, as well as issues of practical implementation and use, and techniques for assessing the performance. The course work includes a term project involving programming and/or work with real-life datasets.

Pre-requisite: The course is designed for graduate students in computer science, but is also open to students from other majors. The mathematical literacy (multivariable calculus, probability, linear algebra) and computational literacy (programming languages such as R, Python or MATLAB) at the beginner graduate student level is expected.

Software: The data examples will use the programming language R. Homework assignments in R, Python or MATLAB will be accepted.

Course web page: <http://www.ccs.neu.edu/course/cs6140sp17/CS6140-Spring17.html>
Daily updates on the schedule, handouts and homework assignments will be posted on the course page.

Attendance: Attendance is optional, but you are responsible for all the material covered in class.

Communication: The course will be using the discussion board Piazza piazza.com/northeastern/spring2017/cs6140 You are encouraged to ask and answer questions on the discussion board. All important announcements will be made through Piazza. Please use public messages for all content-related posts, and private messages for personal matters. *Please no email. Course-related inquiries through personal email will be left unanswered.*

Textbook: Required textbooks:

Machine Learning: A Probabilistic Perspective. Kevin P. Murphy, MIT Press 2012.

Elements of Statistical Learning. T. Hastie, R. Tibshirani and J. Friedman, Springer, 2009.

Optional textbooks:

Pattern Classification, 2nd Edition. R. O. Duda, P. E. Hart, D. Stork, Wiley and Sons, 2001.

Pattern Recognition and Machine Learning. C. M. Bishop, Springer 2006.

Machine Learning. T. Mitchell, McGraw-Hill, 1997.

Homework: Expect biweekly homeworks during the semester. Extensions to homework deadlines can be obtained if requested at least 48 hours before the deadline, and duly justified. Homeworks turned in after the deadline will not receive credit.

Although some aspects of the homeworks can be discussed with your colleagues and on Piazza, each homework should be done independently. A homework having high level of similarity with that of another (current or past) student is considered plagiarism, and is not accepted.

Exams: One in-class midterm exam, and one final exam.

Project: At the end of the semester groups the students will perform a group project analyzing a real-world problem.

Grades: All grades will be distributed via Blackboard.

Re-grades: All re-grading requests should be made in writing, within one week after receiving the grade. The request should state the specific question that needs to be re-graded, as well as a short (1-2 sentences) explanation of why re-grading is necessary. The new grade can potentially be lower than the original grade.

Breakdown of the final grade: The final grade is based on a total of 400 points broken down into homeworks (100 pts), midterm (100 pts), project (100 pts), final exam (100 pts).

The final letter grades will follow the usual scale:

90-100 = A, 80-89 = B, 70-79 = C, 60-69 = D, 0-59 = F.

Half-points (i.e., '+' and '-'), may also be allocated.

The scale is subject to change at any time, at the discretion of the instructor.