SWE 582: Sp. Tp. Machine Learning for Data Analytic

Fall 2019

Instructor: İnci M. Baytaş

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Office: BM 24

Office Hours: Wednesday 18:00-19:00

Time: Wednesday 19:00-21:50

Location: BM A5

Textbook:

Learning from Data, Yaser S. Abu-Mostafa, Malik Magdon-Ismail, and Hsuan-Tien Lin, 2012.

Course Description: An introduction to machine learning, including perceptron, linear regression, logistic regression, naive Bayes, decision tree, support vector machine, unsupervised learning, and neural networks.

Objectives and Learning Outcomes: The objective of this course is to provide the foundations of machine learning and its practical use. Upon successful completion of this course, students will have gained the necessary understanding on:

- linear supervised learning algorithms and their implementations
- popular unsupervised learning algorithms and their implementations
- an introduction to neural networks as non-linear supervised learning models

Class Participation: There will not be a roll call in this class. However, students must be aware of the fact that attending classes and actively participating in discussions are required to be successful in this class. The instructor will also consider class participation while assigning final grades.

Tentative Class Schedule:

Week	Date	Topic	Homework and Exam
1	September 25	Introduction	
2	October 2	Perceptron	HW1
3	October 9	Linear Regression I	
4	October 16	Linear Regression II	HW1 due, HW2
5	October 23	Logistic Regression I	
6	October 30	Logistic Regression II	HW2 due, HW3
7	November 6	Naive Bayes	
8	November 13	Decision Tree	Midterm Exam
9	November 20	Support Vector Machine I	
10	November 27	Support Vector Machine II	HW3 due
11	December 4	Clustering	HW4
12	December 11	Principal Component Analysis	
13	December 18	Neural Networks	HW4 due

Course Announcements: Announcements will be sent via Piazza. Homework will be posted and collected through Piazza.

Grading:

- Midterms (1) 30%
- Homework (4) 40%
- Final 30%

Final grades will be assigned as follows:

Absolute Percentage	Grade
$[100, 90]$	4.0
$(90, 80]$	3.5
$(80, 75]$	3.0
$(75, 70]$	2.5
$(70, 65]$	2.0
$(65, 60]$	1.5
$(60, 50]$	1.0
$(50, 0]$	0.0

The instructor may move the thresholds down (but not up) based on the distribution of final grades.

Homework: Homework report must be typed and submitted with its code to Piazza online. No handwritten homework will be accepted. Scanning handwritten homework is also not allowed.

Late Homework and Extensions: Late homework will not be accepted. A student may ask for only one extension throughout the semester. Extension requests should be sent to the instructor via email at least **2 days** before the original deadline. Late submission rule also applies to extensions. A student cannot ask for more than **7 days** of extensions starting from the original deadline.

Makeup Exams: There will not be any makeup of the midterm exam. Follow academic calendar to apply for makeup of the final exam.

Academic Integrity: Students are expected to complete all homework assignments and exams on their own. If any source is used to do a homework, student needs to cite the reference. Cheating in homework and exams is extremely forbidden. Cheating includes copying answers from internet, a friend, or from notes in a closed-book exam. If the instructor detects any cheating in homework, the students, who got involved in cheating, will get -100 for that homework. If the student cheats during exams, disciplinary actions will be taken.

Acknowledgement: In preparation of this course, course material of CSE 404 by Jiayu Zhou at Michigan State University and course text book were used.