TEXAS A&M UNIVERSITY

SYLLABUS

Course title and number	CSCE 633: Machine Learning
Term	Spring 2019
Meeting times and location	8-9.15am, HRBB 124

Course Description and Prerequisites

Machine learning is a sub-field of Artificial Intelligence that gives computers the ability to learn and/or act without being explicitly programmed. Applications of machine learning have permeated many aspects of every-day life and can be found among others in self-driving cars, speech recognition, computer vision, and genomics. Topics include supervised and unsupervised learning (including parametric and non-parametric models, clustering, dimensionality reduction, deep learning), optimization procedures, and statistical inference.

Learning Outcomes or Course Objectives

The objective of this course is to teach fundamental methods of machine learning with focus on the theoretical underpinnings, practical implementations, and experimentation.

Instructor Information

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Office location	315D HRBB

TA Information

Name	TBA
Email address	TBA
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Office location	TBA

Textbook and/or Resource Material

- Machine Learning: A Probabilistic Perspective, MIT Press by Kevin Murphy
- Introduction to Machine Learning, 3rd edition, MIT Press by Ethem Alpaydin
- Machine Learning, McGraw Hill by Tom Mitchell

Grading Policies

1. Three assignments (including written and programming components), 15% each = 45%
2. Two exams (in class), 15% each = 30%
3. Final project and presentation 25% (proposal 5%, report 10%, presentation 10%)

Grading Scale

The cutoff for an `A' will be at most 90% of total score, 80% for a `B', 70% for a `C', and 60% for a `D'. However, these cutoffs might be lowered at the end of the semester to accommodate the actual distribution of grades.

Course Topics, Calendar of Activities, Major Assignment Dates

Week	Topic	Required Reading
1	Introduction	Alpaydin 1; Mitchell 1.1-1.2, 1.3-1.5; Murphy 1-2
2	Supervised Learning (general)	Alpaydin 2; Mitchell 7.1-7.2, 7.4; Murphy 7
3	Logistic Regression & Regularization	Mitchell Supplementary Material; Murphy 8 Homework 1 Announced
4	Decision Trees & Random Forests	Alpaydin 9; Mitchell 3; Murphy 16.2
5	Support Vector Machines & Kernel Methods	Alpaydin 13.1-13.5; Murphy 14 Homework 2 Announced Homework 1 Due
6	Neural Networks: Representation & Learning	Alpaydin 11; Mitchell 4
7	Exam #1	Homework 2 Due
8	Deep Learning Techniques	Murphy 28; Optional Reading: Jurgen Schmidhuber's Deep Learning; Hinton's Tutorial on Deep Belief Networks Homework 3 Announced
9	Unsupervised Learning & Dimensionality Reduction	Alpaydin 6,12; Murphy 12 Project Proposal Due
10	Bayesian Learning	Mitchell 6; Murphy 11
11	Boosting & Ensemble Learning	Murphy 16.4, 16.6 Homework 3 Due
12	Markov & Hidden Markov Models	Murphy 17; Optional Reading: Rabiner 1989
13	Exam #2	
14	Application Examples: Recommender Systems, Self-Driving Cars, Human Affect Recognition	Optional Reading: Covington et al. 2016; Huval et al. 2015; Zeng et al. 2009
15	Project Presentations	Project Report Due

Other Pertinent Course Information

1. Computer accounts: if you do not have a unix account, ask for one on the CS web page.
2. Programming languages permitted: C/C++, Java, Python, or Matlab (or octave), and must be executable on CS unix hosts or other public systems in the department lab.

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

Academic Integrity

For additional information please visit: http://aggiehonor.tamu.edu

"An Aggie does not lie, cheat, or steal, or tolerate those who do."