2309 CS462/SE462 Course Outline

Subject Code	:	CS462, SE462
Subject Title	:	Machine Learning
Course Type	:	Elective
Level	:	3
Credits	:	3
Teaching Activity	:	Lecture 30 hours
	:	Programming 15 hours
Prior Knowledge*	:	CS110: COMPUTER PROGRAMMING MATH101: CALCULUS I MATH102: CALCULUS II MATH104: PROBABILITY AND STATISTICS MATH100: LINEAR ALGEBRA
Class Schedule	:	

Class	Week	Time	Classroom	Date
D1	MON	9:00-11:50	C404	2022/09/04-2022/12/17

Instructor	:	Zhao Qinglin
Contact Number	:	(853)88972306
E-mail Address	:	qlzhao@must.edu.mo
Office	:	A212
Office Hour	:	Monday: 15:00-18:00 Tuesday: 15:00-18:00 Wednesday: 14:30-17:30 Friday: 9:00-10:00

COURSE DESCRIPTION

Machine learning (ML) is one of the hottest fields of research today. It allows computational systems to adaptively improve their performance with experience accumulated from the data observed. It introduces the basics of learning theories, the design and analysis of learning algorithms, and some applications of machine learning.

TEXT BOOK

Book title: Learning From Data
Author/Editor: Yaser S . Abu-Mostafa, Malik Magdon-Ismail, Hsuan-Tien Lin
Edition: 1

ISBN 10: 1600490069
ISBN 13: 9781600490064
Publisher: AMLBook
Date: 2012

INTENDED LEARNING OUTCOMES

Upon the successful completion of this course students will be able to:

1. Understand when machines can learn.
2. Understand why machines can learn.
3. Understand how machines can learn.
4. Design simple algorithms that machines can learn better.
5. Design simple machine-learning algorithms by combining predictive features.
6. Design simple machine-learning algorithms by distilling hidden features.

Weekly Schedule

Index	Topic	Hours	Teaching Method
1	Basics of machine learning	3	Lecture
2	The learning problems	3	Lecture
3	Feasibility of learning	3	Lecture/lab
4	Theory of generalization	3	Lecture/lab
5	Linear models	3	Lecture/lab
6	Beyond basic linear models	3	Lecture/lab
7	Combatting overfitting-I	3	Lecture/lab
8	Combatting overfitting-II	3	Lecture/lab
9	Mid-exam	3	Lecture/lab
10	Putting it altogether: support vector machine	3	Lecture/lab
11	Soft-margin support vector machine	3	Lecture/lab
12	Bagging and boosting	3	Lecture/lab
13	Decision tree ensembles	3	Lecture/lab
14	Deep learning fundamentals-I	3	Lecture/lab
15	Deep learning fundamentals-II	3	Lecture/lab

ASSESSMENT APPROACH

Assessment method	Weight(%)
1. Attendance and assignment	15%
2. Project	10%

3. Mid-term Exam	25%
4. Final Exam	50%
Total	100%

Guideline for Letter Grade:

Marks	Grade
93 - 100	A+
88 - 92	A
83 - 87	A-
78 - 82	B+
72 - 77	B
68 - 71	B-
63 - 67	C+
59 - 62	C
56 - 58	C-
53 - 55	D+
50 - 52	D
Below 50	F

Notes:
Students will be assessed on the basis of continuous assessment (i.e. coursework in the form of individual assignments and group work) and by an end of semester examination.

The coursework assessment items (e.g., assignment, project, and presentation etc.) evaluate students' ability to implement programming solution to practical problems using applying the data structures and algorithms.

Final examination will primarily evaluate students' overall understanding of main topics covered in the course (i.e., how to organize data and analyse algorithms when they develop programs).

ADDITIONAL READINGS

Journals:

Conferences: NIPS, ICML, AAAI

Trade and other Publications:

Website:
All source codes used in teaching and guidelines are available on moodle.