Course program and reading list

Semester 2 Year 2021

School: Efi Arazi School of Computer Science B.Sc

Machine Learning from Data

Lecturer:

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Course No.:	Course Type :	Weekly Hours :	Credit:
3141	Lecture	4	4

Course Requirements :	Group Code :	Language:
Exam	212314101	Hebrew

Prerequisites

Equivalent:

53 - Calculus II

Prerequisite:

52 - Calculus I
53 - Calculus II
54 - Linear Algebra I
55 - Linear Algebra II
77 - Algorithms
109 - Introduction To Probability

Students who took one of the courses listed below will not be allowed to register to the course Machine Learning from Data (3141):

3566 - Introduction to Machine Learning

Course Description

An introductory level machine learning course. We will present the main principles of data-

driven learning algorithms. We will provide the theoretical basis for learning algorithms and learn about pros and cons of different approaches, from a mathematical point of view. Students will implement and use algorithms and will practice their application in real life data contexts.

Course Goals

Subjects covered include:

1. Linear models: regression and LMS classification
2. Decision trees
3. Bayesean learning
4. Neural networks
5. Density estimation and EM
6. SVMs
8. Unsupervised learning - clustering techniques
9. VC dimension and other theoretical aspects

Algorithms and examples will be discussed and analyzed.

Homework assignments will include practical tasks and the use of new and existing Java methods to address specific learning tasks.

Successful students will have knowledge of several important machine learning algorithms and experience in applying them in simple datasets and learning tasks.

Grading

0.5*HW + 0.5*Exam.

Must pass exam as well as the HW.

HW assignments are in pairs. Only exceptional cases will be considered for submission in singles.

Learning Outcomes

Successful students will have knowledge of several important machine learning algorithms and experience in applying them in simple datasets and learning tasks.

Lecturer Office Hours

Zohar Yakhini Thu 1030-1130 Arazi C121a

Tutor Office Hours

TBA

Teaching Assistant

Alon Oring, Yinnon Meshi, Jonathan Simon, Daniel Karelnik, Shuly Finley

Contact details will be included in the slides for the first class

Reading List

1. Duda, Hart and Stork: Pattern Classification
2. Mitchel: Machine Learning
3. Bishop: Pattern Recognition and Machine Learning
4. James, Witten, Hastie, Tibshirani: An introduction to statistical learning
5. Online courses: Andrew Ng, Pedro Domingos