

Introduction to Machine Learning [CS-1390] [CS-1390-1]

Faculty Name

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Overview

Coverage:

Supervised Learning Algorithms: Logistic Regression, Neural Networks, Decision Trees, Nearest Neighbour, Support Vector Machines, Naive Bayes. ML and MAP estimates. Bayes' Optimal Classifier. PAC learnability and generalisation. Introduction to Graphical Models. Generative Vs. Discriminative Models. Unsupervised learning algorithms: K-Means clustering, Expectation Maximization, Gaussian Mixture Models, Graph-cuts and spectral methods. PCA and Feature Selection. Reinforcement Learning. Deep Learning: CNNs and Trnasformers. Some application areas of machine learning.

Prerequisites:

Basic proficiency in programming and data structures, probability theory and linear algebra.

Reading:

Pattern Recognition and Machine Learning by Christopher M. Bishop. Springer.

Probabilistic Machine Learning: An Introduction by Kevin P. Murphy. The MIT Press.
(<https://probml.github.io/pml-book/>)

Learning Outcomes

Basic familiarity with Machine Learning.

Requirements (Reading List and other materials)

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Basic proficiency in programming and data structures, probability theory and linear algebra.

Reading:

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Grading Rubric

Mid-term: 25%, Final: 25%, Assignments, quizzes and projects: 50%

Attendance Policy

No attendance will be recorded, but 100% attendance will be expected. It will be difficult to cope if classes are missed.

There will be no accommodation for missed in-class tests and quizzes.