אוניברסיטת
בן-גוריון בנגב

The Department of Mathematics

2025–26–B term

Course Name Introduction to machine learning

Course Number 202.1.3101

Course web page
`https://math.bgu.ac.il//en/teaching/spring2026/courses/introduction-to-machine-l`

Office Hours `https://math.bgu.ac.il/en/teaching/hours`

Abstract

Requirements and grading[1]

Course topics

How does a search engine decide what search results to present? How can a car camera identfiy automatically whether a pedestrian is crossing? How can we find out which drug is suitable for which patient? How can any application use data from many users to automatically improve user experience? These problems and many more can be solved with modern methods based on machine learning. In this class we will survey diverse practical and successful methods, which can be implemented efficiently and simply, even with very large input sizes. We will understand the mathematical reasoning behind these methods, and apply them in practice on data from real problems. The following topics will be covered: - Supervised learning methods for automatic classfiication and prediction: Nearest neighbots, SVM, kernels, decision trees, random forests, neural networks, naive Bayes, linear regression. - Unsupervised learning: PCA dimensionality reduction, clustering with k-means and other methods. - Model fitting methods such as Gaussian mixtures, maximum likelihood, and EM.

[1] Information may change during the first two weeks of the term. Please consult the webpage for updates