Course Syllabus

INTRODUCTION TO MACHINE LEARNING

Instructor	Said Bolluk
Textbooks	1. Ethem Alpaydin. (2020). Introduction to Machine Learning (4th ed.). The MIT Press. 2. Shalev-Shwartz, S., & Ben-David, S. (2014). Understanding Machine Learning: From Theory to Algorithms (1st ed.). Cambridge University Press.
COURSE SUBJECTS	
Lecture 1	INTRODUCTION • What is Machine Learning? • Supervised Learning • Unsupervised Learning • Required Background in ML
Lecture 2	REGRESSION • Projection Matrix • Ordinary Least Squares • Regression Evaluation Metrics
Lecture 3	CLASSIFICATION • Useful Notes on Probability • Bayes' Theorem • Parametric Classification • Non-Parametric Classification • K-Nearest Neighbor Classifier • Decision Tree Classifier • Classification Evaluation Metrics

Lecture 4	CLUSTERING • What Is Clustering? • K-Means Clustering • Spectral Clustering • Hierarchical Clustering • Clustering Evaluation Metrics
Lecture 5	LOGISTIC DISCRIMINATION • Gradient Descent • Stochastic Gradient Descent • Two-Class Logistic Regression • Multi-Class Logistic Regression
Lecture 6	MULTILAYER PERCEPTRON • Introduction to Multilayer Perceptron • Forward Pass Calculation • Backpropagation • Special Topics in MLP