ANKARA UNIVERSITY

Computer Engineering Department

COM448: Pattern Recognition

Syllabus

Instructor: Asst. Prof. Dr. Hacer Yalım Keleş

Textbook:

- *Pattern Classification*, Richard O. Duda, Peter E. Hart, David G. Stork (Second edn.)
- *Pattern Recognition*, Sergios Theodoridis & Konstantinos Koutroumbas, (Third Edn.)
- "*Deep Learning* ", Ian Goodfellow, Yoshua Bengio, Aaron Courville, MIT Press, 2016.

Pre-requisites:

-Basic Linear Algebra, (Vector and Matrix operations)
-Basic Mathematical Statistics
-Algorithms and Complexity

Aim:

Aim is studying the fundamental concepts, theories and algorithms for pattern recognition.

Course Topics:

Week 1: Introduction

Week 2: Bayesian Decision Theory

Minimum Error-rate Classification

Week 3: The Normal Density (Univariate and multivariate)

Discriminant Functions for Normal Density (3 cases)

Week 4: Maximum Likelihood param. Estimation

Bayesian Estimation

Week 5: Component Analysis and Discriminants

Principle Component Analysis

Fisher Linear Discriminant

Week 6: Non-parametric techniques

Parzen Windows

kNN estimation

Week 7: Linear Discriminant Functions

Generalized LDF

Week 8:Perceptron criterion

Week 9: Midterm

Week 10: Multilayer Neural Networks

Week 11:Feedforward Operation

Backpropagation algorithm

Week 12: Convolutional Neural Networks

Week 13: Linear Regression Methods

Week 14:Unsupervised Learning and Clustering

Student Assessment:

Item	Weight
Midterm	30%
Final	80%