MACHINE LEARNING

Module: 1

Introduction, Linear classification, perceptron Update rule, perceptron convergence, generalization, Maximum margin classification, Classification errors, regularization, Logistic regression, linear regression.

Module: 2

Estimator bias and variance, active learning, on linear prediction, kernel, kernel regression, and Support vector machines (SVM) and kernels, kernel optimization and model selection, Model selection criteria.

Module: 3

Description length ,Feature selection, Combining classifiers, boosting margin and complexity, Margin and generalization, mixture models ,Mixture and expectation maximization,(EM) algorithm, Regularization.

Module: 4

Clustering and Spectral Clustering,Markov models, Hidden Markov Models(HMM),Bayesian Networks, Learning Bayesian Networks, Probabilistic inference, Collaborative filtering.

Text book(s):

1. Machine Learning, Mitchell, Tom, McGraw-Hill, ISBN: 97800704280, 3rd Edition.

Reference Book(s):

1. Neural Networks for pattern Recognition, Christopher, Bishop, Oxford University, Press, 1995, ISBN: 9780198538646.
2. Pattern Classification, Richard,Duda,Peter Hart and David Stork, Wiley Interscience,2000,ISBN:9780471056690
3. The Elements of Statistical Learning: Data Mining, Inference and prediction, Hastie.T.R.Tibshirani and J.H.Friedman, NY.Springer, ISBN: 9780387952840, 2005.
4. Information Theory, Interference and learning algorithms. MacKay, David, Cambridge University Press, ISBN: 9780521642989, 2003.