Pattern Recognition

Comprehensive Exam Syllabus

August 26, 2019

References:

1. C.M. Bishop, *Pattern Recognition and Machine Learning*, Springer, New York, 2006. Download from https://www.microsoft.com/en-us/research/people/cmbishop/
2. R. O. Duda, P. E. Hart, and D. G. Stork, *Pattern Classification*, 2nd ed., Wiley, New York, 2001.
3. B. D. Ripley, *Pattern Recognition and Neural Networks*, Cambridge University Press, Cambridge, U.K., 1996.

Topics:

1. Bayesian decision theory; maximum a posteriori decision rule
2. MAP decision rule for Gaussian class densities
3. Linear classifiers: perceptrons, plugged-in classifiers, pseudo-inverse solution, batch gradient descent, mini-batch gradient descent
4. Linear regression; logistic regression
5. Kernel methods for classification; nearest neighbor classification
6. Principal component analysis
7. Clustering: K-means, DBSCAN