Pattern Classification and Machine Learning

FEN3202

Points for Lecture 3

Saikat Chatterjee

I. Discussion Agenda

1) The Gaussian distribution, Section 2.3 of the text book.

   Discussion points: equation 2.42, 2.43, central limit theorem, Figure 2.6, equation 2.44, Mahalanobis distance, Figure 2.7, latent variable (page no. 84); Conditional Gaussian distribution (section 2.3.1), equation 2.65-2.69, details about equation 2.70, completing the square, equation 2.71, equation 2.72-2.75, equation 2.76-2.82, linear Gaussian model; Marginal Gaussian (section 2.3.2); Bayes' theorem for Gaussian (section 2.3.3), equation 2.113-2.117; Maximum likelihood for Gaussian (section 2.3.4), equation 2.118-2.225; Sequential estimation (equation 2.126), Robbins-Monro solution;

   Bayesian inference for Gaussian (Section 2.3.6 - Very important part), mean estimation, equation 2.137-2.143, and its clear explanation, Figure 2.12, sequential approach, equation 2.144; variance estimation, equation 2.145, Gamma density, equation 2.146, equation 2.149-2.151; inverse gamma density; Joint mean and variance estimation, equation 2.152-2.153, Normal-Gamma density, Wishart distribution, equation 2.155, Normal-Wishart distribution, equation 2.157; Mixture of Gaussians (section 2.3.9), Figure 2.22, equation 2.188-2.193, Expectation-Maximization (EM).