

Pattern Classification and Machine Learning

FEN3202

Points for Lecture 4

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I. DISCUSSION AGENDA

- 1) The Student's t density (page no. 102-105), Non-parametric methods (section 2.5), histogram, problem with histogram (page. 121), Kernel density estimation (section 2.5.1), equation 2.248, 2.250
- 2) Linear models for regression, **Chapter 3 of the text book.**
 Discussion points: supervised learning, linear regression, Problem statement
 Linear Basis Function Models (section 3.1), equation 3.1-3.3, Some ideas about Basis functions: polynomial, splines, Gaussian, sigmoid, Fourier, wavelets, Figure 3.1
 Maximum likelihood and least-squares (section 3.1.1), equation 3.7-3.17, equation 3.21, Geometry of least-squares (LS)
 Regularized LS (section 3.1.4), equation 3.24-3.30, Figure 3.3, Multiple outputs (section 3.1.5), equation 3.31-3.35
 Bayesian linear regression (section 3.3), discussion of model complexity and problem statement (page 152)
 Parameter distribution (section 3.3.1), equation 3.48-3.55, illustrative example by straight line fit (page 154-155), Figure 3.7, general Gaussian prior, equation 3.56
 Predictive distribution (section 3.3.2), equation 3.57-3.59
 Equivalent kernel (section 3.3.3), equation 3.60-3.62