Advanced Machine Learning

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Administration

A seminar course
• Classes:
  – Lectures
  – Student (topic-centered) presentations

• No homework assignments

• Short abstracts for assigned readings due before the class

• Course projects
Administration

Course Projects:
• 2 projects
  – Midterm project (assigned)
  – Final project (student writes a proposal)

• Grading:
  – Projects
  – Paper presentations/ discussions

Study material

Study material:
• Textbook from CS 2750
• Handouts (electronic or hardcopy form)

• Books:
  – Chris Bishop. Pattern recognition and Machine Learning
Study material

Other books:
• Koller, Friedman. Probabilistic graphical models.

Tentative topics

• Review: supervised learning, density estimation
• Extending standard learning framework:
  – sparsity, learning to rank, multiple task
• Low dimensional representation of data
  – Component analysis and their applications
    • PCA, LSA, PLSA, pPCA, ICA, etc
  – Latent variable models
    • Variational approximations
• Kernels
  – Kernel methods, Kernel-PCA, string kernels, etc.
• Non-parametric models and methods:
  – Graph-based kernels for classification and clustering
  – Metric learning
• Gaussian processes