



CS 229

Machine Learning

Handout #2: Tentative Course Schedule

Syllabus

- **Introduction** (1 class) Basic concepts.
- **Supervised learning.** (6 classes) Supervised learning setup. LMS. Logistic regression. Perceptron. Exponential family. Generative learning algorithms. Gaussian discriminant analysis. Naive Bayes. Support vector machines. Model selection and feature selection. Ensemble methods: Bagging, boosting, ECOC.
- **Learning theory.** (3 classes) Bias/variance tradeoff. Union and Chernoff/Hoeffding bounds. VC dimension. Worst case (online) learning. Advice on using learning algorithms.
- **Unsupervised learning.** (5 classes) Clustering. K-means. EM. Mixture of Gaussians. Factor analysis. PCA. MDS. pPCA. Independent components analysis (ICA).
- **Reinforcement learning and control.** (4 classes) MDPs. Bellman equations. Value iteration. Policy iteration. Linear quadratic regulation (LQR). LQG. Q-learning. Value function approximation. Policy search. Reinforce. POMDPs.

Dates for assignments

- Assignment 1: Out 10/3. Due 10/17.
 - Assignment 2: Out 10/17. Due 10/31.
 - Assignment 3: Out 10/31. Due 11/14.
 - Assignment 4: Out 11/14. Due 12/3.
 - Term project: Proposals due 10/19. Milestone due 11/16. Poster presentations on 12/12; final writeup due on 12/14 (no late days).
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