CS 229
Machine Learning
Handout #2: Course Schedule

Syllabus

Introduction (1 class)
- Basic concepts.

Supervised learning. (7 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.
- Evaluating and debugging learning algorithms.

Learning theory (3 classes)
- Bias/variance tradeoff. Union and Chernoff/Hoeffding bounds.
- VC dimension. Worst case (online) learning.
- Practical advice on how to use learning algorithms.

Unsupervised learning. (5 classes)
- Clustering. K-means.
- EM. Mixture of Gaussians.
- Factor analysis.
- PCA (Principal components analysis).
- ICA (Independent components analysis).

Reinforcement learning and control. (4 classes)
- MDPs. Bellman equations.
- Value iteration and policy iteration.
- Linear quadratic regulation (LQR). LQG.
- Q-learning. Value function approximation.
- Policy search. Reinforce. POMDPs.

Dates for Assignments

- Assignment 1: Out 09/30. Due 10/14.
- Assignment 2: Out 10/14. Due 10/28.
- Assignment 3: Out 10/28. Due 11/12.
- Assignment 4: Out 11/11. Due 12/02.
- Midterm: 11/04, 6-9pm.
- Term project: Proposals due 10/16 (by 11:59PM). Milestone due 11/13 (5pm). Poster presentations on 12/08 (8.30am-11.30am); final writeup due on 12/11 (11:59pm, no late days).