

CS478 – Machine Learning

Tentative Syllabus – Spring 2000

1. Introduction (1 lecture)
 - What is machine learning?
2. Supervised Learning (10 lectures)
 - Concept learning
 - Version spaces
 - Inductive bias
 - Decision tree learning
 - Instance-based learning
 - Locally weighted regression
 - Learning rules
 - Neural networks: backpropagation
 - Recurrent Networks
 - Empirical evaluation of learning systems
3. Unsupervised Learning (4 lectures)
 - K-means clustering
 - Kohonen networks
 - COBWEB
 - The EM algorithm
4. Computational Learning Theory (4 lectures)
 - PAC learning
 - VC dimension
 - Mistake bounds
 - Winnow
 - Boosting
 - Bagging
5. Bayesian Learning (3 lectures)
 - MAP and ML learners
 - Bayes Optimal Classifier
 - Gibbs sampling
 - Naive Bayes
6. Other Topics (6 lectures)
 - Issues for knowledge discovery and data mining
 - Support Vector Machines
 - Association rules
 - Learning from sequences: HMMs
 - Transformation-based learning
 - Classification of minority instances
 - Feature selection
 - Genetic algorithms
 - Genetic programming