COMP 4360: Machine Learning

Course Description: Learning strategies; evaluation of learning; learning in symbolic systems; neural networks, genetic algorithms.
Prerequisite: COMP 3190.

Outline

1) Concept Learning (4 weeks)
   Version spaces, inductive bias, learning of disjunctions, case-based meta learning.
2) Decision trees (3 weeks)
   ID3 and C4.5, the overfitting problem.
3) Neural nets (3 weeks)
   Perceptrons, gradient descent, backpropagation.
4) Instance-based learning (1 week)
   K-nearest neighbor algorithm, locally weighted regression, case-based reasoning.
5) Bayesian Learning (1 week)
   Bayes theorem, statistical independence, naive Bayesian learning.
6) Genetic algorithms (1/2 week)
   Classification using genetic algorithms, genetic programming.
7) Reinforcement learning (1/2 week)
   Dynamic programming, temporal difference learning, Q-learning.

Text: Tom. M. Mitchell, *Machine Learning*, 1st Edition, McGraw Hill