

CSC465: Machine Learning

Definition and examples of broad variety of machine learning tasks, including classification, Inductive learning, Simple statistical-based learning, such as Naive Bayesian Classifier, decision trees, Parameter estimation (maximum likelihood), Supervised learning: Learning decision trees, Learning neural networks, Support vector machines (SVMs). Nearest-neighbor algorithms. Unsupervised Learning and clustering: EM, K-means, Self-organizing maps. Semi-supervised learning. Learning graphical models. Measuring classifier accuracy. The problem of overfitting, the curse of dimensionality. Performance evaluation (such as cross-validation, area under ROC curve). Learning theory. Reinforcement learning, Exploration vs. exploitation trade-off, Markov decision processes, Value and policy iteration, Application of Machine Learning algorithms to Data Mining.