Winter 2008

CS 714-01: Machine Learning

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CS714: Machine Learning
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Information
Syllabus
Assignments

Tentative Syllabus

Day	Topic	Reading	Optional Reading
1/07/08	Introduction	B 1-2; HTF 1	The discipline of machine learning by T. Mitchell
1/09/08	Linear prediction	B 3.1.1-2	
1/14/08	Generalized linear prediction	B ; HTF 5.1-2, 5.7, 5.9, 6.1-3	
1/16/08	Regularization, neural networks	B 3.1, 5; HTF 3.4, 5.4, 11; B 5	
1/21/08	Learning theory: Bias-variance	B 3.2; HTF 2.9, 7	
1/23/08	Automated complexity control	HTF 7	
1/28/08	Linear classification, support vector machines	B 7.1.1-2; HTF 4.5, 12.1-3	Excerpt from Vapnik's *The Natural of Statistical Learning Theory*; Support vectors machines with applications
1/30/08	Duality	HTF 4.5, 12.1-3	
2/04/08	Kernels	HTF 5.8, 6.1-2, 6.7	
2/06/08	Multiclass prediction	B 7.1.3	
2/11/08	Learning theory: Uniform convergence		
2/13/08	Vapnik-Chervonenkis dimension	HTF 7.9	
2/18/08	Combining classifiers, boosting	HTF 10	Toy example, training error proof and slides by Schapire
2/20/08	Probability models		
2/25/08	Bayesian networks and	B 8.1, 8.3	

	Markov random fields		
2/27/08	Maximum likelihood estimation	B	
3/03/08	Expectation-Maximization algorithm	B 9.2-4; HTF 8.5	
3/05/08	Hidden Markov models	B 13.1-2	HMM tutorial by L. Rabiner; Examples
3/10/08	Structured prediction: conditional random fields		CRF paper and video by Lafferty et al
3/12/08	Structured prediction: max-margin Markov networks		M3N paper and slides by Taskar et al; M3N tutorial by S. Lacoste-Julien
3/17/08	Challenges in statistical machine learning		Challenges in statistical machine learning and video by J. Lafferty