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CS 712: Advanced Topics in Artificial Intelligence: Inference Graphical Models

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CS712 ADVANCED TOPICS IN ARTIFICIAL INTELLIGENCE: INFERENCE GRAPHICAL MODELS FALL 2008

INFORMATION SYLLABUS SELECTED READINGS

TENTATIVE SYLLABUS

Day	Topic	Reading	Optional Reading
9/16/08	Introduction, factor graphs, self-reduction		Kschischang and Frey, " <u>Factor graphs and the sum-product algorithm</u> ," IEEE Transactions on Information Theory, 47(2):498-519, 2001
9/18/08	Message passing algorithms from statistics, computer science and communications		
9/23/08	Variational methods, free energy and Gibbs free energy		M. Wainwright and M. Jordan, " <u>A variational principle for graphical models</u> ," In New Directions in Statistical Signal Processing: From Systems to Brain. MIT Press.
9/25/08	Variational methods, Ising models and fixed point iteration		
9/30/08	Bethe free energy and locally consistent marginals		J. Yedidia, W. Freeman and Y. Weiss, " <u>Constructing free-energy approximations and generalized belief propagation algorithms</u> ," IEEE Transactions on Information Theory,

51(7):2282-2312, 2005

- 10/02/08 Regiona-based approximations and generalized belief propogation
- 10/02/08 Tree based upper/lower bound approximations
- 10/07/08 Monte Carlo Markov chain (MCMC)
- 10/09/08 Density evolution
- 10/14/08 Gibbs measures on trees: uinqueness, extremality, mixing
- 10/16/08 Tree pruning algorithm
- 10/21/08 The cavity method
- 10/23/08 Presentation
- 10/28/08 Presentation
- 10/30/08 Presentation
- 11/04/08 Presentation
- 11/06/08 Presentation
- 11/11/08 Veteran's (University Closed)
- 11/13/08 Presentation