

Coordinates:

Time: 11:10am - 12:30pm, Tuesdays and Thursdays
 Location: HMNSS 1405

Instructor:

Christian Shelton
 cshelton@cs.ucr.edu
 office hours: Wednesdays 2-5pm, EBU II, 327

Text: Handouts: draft of a text by Nir Friedman and Daphne Koller

Course Purpose: This course will cover the basics of graphical models (Markov networks, Bayesian networks, and the like), including inference and learning. We will focus on Bayesian Networks and cover related models in the last two weeks of the course.

Tentative Class Schedule:

week		Tuesday		Thursday	assigned	due
1	4/4	Introduction	4/6	Representations	PS 1, Project	
2	4/11	Independence Properties	4/13	Inference		
3	4/18	Variable Elimination	4/20	Junction Trees		PS 1
4	4/25	Likelihood Weighting	4/27	MCMC	PS 2	
5	5/2	Variational Approximations	5/4	Loopy Propagation		Proposal
6	5/9	Learning	5/11	Maximum Likelihood		PS 2
7	5/16	Parameter Learning	5/18	Structure Learning	PS 3	
8	5/23	Expectation Maximization	5/25	DBN		
9	5/30	Markov networks	6/1	Markov networks		PS 3
10	6/6	Gaussian Networks	6/8	Hybrid networks		
————— finals week —————						Project

Course Work: There will be no exams for this course. Three problem sets will be due during the quarter. They will consist of “theory” questions about Bayesian Networks. They will be handed out on Thursdays, two weeks before they are due, in the middle of the material covered on the assignment. All material necessary for the problem set will be covered in class at least one week before the problem set is due.

The class has no final. Instead, you will complete a project based on Bayesian Networks. This can be an implementation project (in which you write the code for an algorithm described in class) or it can be an application project (in which you use Bayesian Networks to solve a problem). Half-way through the course, you will be required to submit a 1-2 paragraph description of your course project.

Homeworks (with the exception of the project) will be due in class on Thursdays. These problem sets will be non-trivial, so allocate enough time for them. Leaving them to the last moment is asking for trouble. They are designed to get you thinking about the details of Bayesian Networks and will help you learn the material. Skipping the homeworks will severely limit your understanding.

External sources: The problem sets are to be done alone. This includes web-based resources of any kind. Bayesian Networks are complex and mathematical. With some hands-on experience, they become natural. However, you must put in the effort on your own to master the topic.

Grade: Each problem set will be worth 20% of your grade. The final project will worth 40% of your grade.