

CS 590M: Graphical Models for Machine Learning

Spring 2008

Instructor: Professor Luo Si

Course Description:

Many of the problems in artificial intelligence, data mining, natural language processing, and computer systems involve uncertainty data. Probabilistic machine learning methods have been proposed to address data with uncertainty. In particular, graphical model framework is one of the most popular machine learning methods, which provides a unified view that enables efficient modeling and inference. This course provides basic concepts of graphical models and connects graphical models with practical applications such as text searching and recommendation systems.

The course is a mixture of lectures for basic concepts of graphical models plus presentations of applications/topics of graphical models. First, the lecturer will teach a set of lectures that cover the basic concepts of graphical model. Second, one or two recent research papers are selected for each application/topic. The papers are presented in class, by the lecturer or by a student, followed by discussion of the strengths, the weaknesses and any potential improvement.

The project portion is a semester-long research project. Students may choose any project suggested by the instructor or propose any related projects they are interested in, subject to instructor's approval. In class presentations will be arranged for the course projects.

Evaluation:

There is no examination. Students are evaluated by the presentations of selected research topics, a course project and course participation.

Textbook:

Daphne Koller, Nir Friedman "Bayesian Networks and Beyond". (Not published yet). Relevant Chapters will be distributed to the class.

Prerequisite:

Basic knowledge of probabilistic and statistics and reasonable program skills (e.g., Java or C++ or Matlab).