STANFORD UNIVERSITY
DEPARTMENT OF STATISTICS

DEPARTMENTAL SEMINAR

4:15 p.m., Tuesday, February 28, 2006
Sequoia Hall Room 200
(Cookies at 3:45 in 1st Floor Lounge)

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Computationally Efficient Estimation of Structured Prediction Models

Structured prediction problems are classification or regression problems in which the output variables are mutually dependent or constrained. These dependencies and constraints may reflect sequential, spatial or combinatorial structure in the problem domain, and capturing these interactions is often as important for the purposes of prediction as capturing input-output dependencies.

Graphical models are used to represent such problem structure across many fields, including computational biology, vision and linguistics.

Typical models are comprised of hundreds of thousands of variables and parameters. In general, the standard (likelihood-based) estimation of such models is intractable because of the exponential explosion of the number of possible joint outcomes.

By drawing on ideas from convex and combinatorial optimization, I will show an alternative estimation method that is tractable for several important classes of models for which standard methods are not. I will demonstrate practical applications of these models for problems in object recognition, protein folding, and machine translation.

Short Biography:

Ben Taskar received his bachelor's degree with distinction in Computer Science from Stanford University. He later returned to Stanford for his master and doctoral degrees in Computer Science. He is currently a postdoctoral fellow at the Electrical Engineering and Computer Science Department at the University of California at Berkeley. His research interests include machine learning, graphical models, large-scale and distributed convex optimization, and applications in computer vision, computational biology and natural language processing. His work on structured prediction models has received best student paper award at the Neural Information Processing Systems (NIPS) conference and best paper award at the Empirical Methods in Natural Language Processing (EMNLP) conference, and his doctoral dissertation was selected runner-up for the Arthur Samuel Best Thesis Award.