STANFORD UNIVERSITY
DEPARTMENT OF STATISTICS

DEPARTMENTAL SEMINAR

4:15 p.m., Tuesday, August 14, 2007 Sequoia Hall Room 200
(Cookies at 3:45 in 1st Floor Lounge)

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Modern meta-analysis: a case study in combining results of diagnostic test data

Meta-analysis of clinical studies reporting diagnostic results is a common problem in medical statistics. Current meta-analytic methods (e.g. the summary ROC curve) fail to propagate the large variability that is presented in these data into the analysis.

The aim of this work is to develop a practical modeling framework for the typical case where clinical studies report estimates of sensitivity and specificity. We build a hierarchical model that allows incorporating multiple sources of variability. The model is further extended to a meta-regression approach.

Statistical computations are performed with Markov chain Monte Carlo (MCMC) methods implemented in WinBUGS software making the model easy to apply for practitioners. Our approach is illustrated with a systematic review evaluating the potential diagnostic benefits of computer tomography scans in diagnostic of appendicitis.