STATISTICS COLLOQUIUM

MONDAY, MARCH 10, 2008
TALK: 4:00 PM — SCIENCE CENTER RM. 309
RECEPTION: 5:15 PM — SCIENCE CENTER, 7TH FLOOR

"Score and Pseudo-Score Confidence Intervals for Categorical Data Analyses"

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ABSTRACT

This talk surveys confidence intervals that result from inverting score or pseudo-score tests for parameters summarizing categorical data. Such methods perform well, often better than inverting Wald or likelihood-ratio tests. "Exact," small-sample methods are conservative inferentially, but inverting a test using the mid-P value provides a sensible compromise. For some models ordinary score inferences are impractical, such as when the likelihood function is not an explicit function of the model parameters. For such cases, we propose pseudo-score inference based on a Pearson-type chi-squared statistic that compares fitted values for a working model with fitted values for special cases. For multinomial data, the pseudo-score interval simplifies to the score interval when the model is saturated but otherwise can be much simpler to construct. Possible generalizations of the method include a quasi-likelihood approach that compares two models with a Pearson-type statistic using fitted values for the models and the variance of the observations under the simpler model. Finally, we briefly summarize a different pseudo-score approach that approximates the score interval for proportions and their differences with independent or dependent samples by adding pseudo data before forming simple Wald confidence intervals.