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Colloquium Announcement

Speaker: Dr. Xiaoyong Wu
Affiliation: Yale University
Date: Wednesday, November 9, 2011
Time: 3:00 p.m.
Room: HH-3026

Title: Parametric and nonparametric tests for genetic association studies

Abstract: Correlation among multiple complex traits has been believed to have a significant impact on genetic association testing. However, such correlation is difficult to account for in both genetic association studies and statistical methodologies. For complex diseases, especially mental illnesses and behavioral disorders, the traits are often measured on an ordinal scale. Although proportional odds logistic models have widely been used for the analysis of ordinal traits in genetic association studies, it still remains difficult to analyze the correlation. To overcome this difficulty, we propose a parametric model called multivariate proportional odds logistic model and a concept of correlation coefficient. The proposed model presents the potentials to test multiple, correlated traits simultaneously in association analysis, which is more powerful than testing a single trait at a time. In addition, since covariates such as environmental factors also play an important role in genetic association studies, we propose nonparametric tests to adjust for covariate effects. A maximum statistic is proposed to achieve optimal power and its asymptotic distribution is derived.