RUTGERS UNIVERSITY
DEPARTMENT OF STATISTICS AND BIOSTATISTICS
HILL CENTER #501, BUSCH CAMPUS, PISCATAWAY

www.stat.rutgers.edu

Seminar

Speaker: John Storey, Department of Molecular Biology, Princeton University

Title: A General Framework for Multiple Testing Dependence

Date: Wednesday November 12, 2008

Time: 3:20 PM

Place: 552 Hill Center

Abstract

I will present a general framework for performing large-scale significance testing in the presence of arbitrarily strong dependence. We have derived a low-dimensional set of random vectors, called a dependence kernel, that fully captures the dependence structure in an observed high-dimensional data set. This result shows a surprising reversal of the "curse of dimensionality" in the high-dimensional hypothesis testing setting. We have also shown theoretically that conditioning on a dependence kernel is sufficient to render statistical tests independent regardless of the level of dependence in the observed data. Finally, I demonstrate that this framework for multiple testing dependence has implications in a variety of common multiple testing problems, such as in gene expression studies, brain imaging, and spatial epidemiology. This is joint work with Jeffrey Leek.