THE UNIVERSITY OF CHICAGO

Department of Statistics

STATISTICS COLLOQUIUM

LI MA

Department of Statistical Sciences
Duke University

A Multi-Resolution Approach to Two-Sample Comparison and the Decomposition of Functional Variability

MONDAY, November 10, 2014, at 4:00 PM
Eckhart 133, 5734 S. University Avenue
Refreshments following the seminar in Eckhart 110

ABSTRACT

In numerous applications, the central inferential goal is to detect and identify differences across multiple data samples and decompose such differences into variance components that can be attributed to various factors. We introduce a multi-resolution inference framework for this purpose that decomposes the "global" nonparametric inference objective into testing a collection of "local" parametric hypotheses organized on a multi-resolution tree. In addition, we utilize graphical modeling techniques, in the form of Markov trees, to incorporate dependency into the local hypotheses. Such dependency is critical for achieving effective multiple testing adjustment due to the almost ubiquitous spatial-scale clustering of differential structures. We derive efficient inference recipe under this framework based on recursive information propagation algorithms. I will introduce the framework in the context of two-sample comparison, and then generalize it to the decomposition of cross-sample variability. Examples from flow-cytometry and genomics will be provided.

For further information and about building access for persons with disabilities, please contact Kirsten Wellman at 773.702.8333 or send email (kwellman@galton.uchicago.edu). If you wish to subscribe to our email list, please visit the following website: https://lists.uchicago.edu/web/arc/statseminars.