THE UNIVERSITY OF CHICAGO

Department of Statistics

STATISTICS COLLOQUIUM

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GAP: A General Framework for Information Pooling in Two-Sample Multiple Testing

MONDAY, October 30, 2017 at 4:30 PM

Eckhart 133, 5734 S. University Avenue

Refreshments before the seminar at 4:00PM in Jones 111

ABSTRACT

In this talk, I will discuss a general framework for exploiting the sparsity information in two-sample multiple testing problems. We propose to first construct a covariate sequence, in addition to the usual primary test statistics, to capture the sparsity structure, and then incorporate the auxiliary covariates in inference via a three-step algorithm consisting of grouping, adjusting and pooling (GAP). The GAP procedure provides a simple and effective framework for information pooling. An important advantage of GAP is its capability of handling various dependence structures such as those arise from multiple testing for high-dimensional linear regression, differential correlation analysis, and differential network analysis. We establish general conditions under which GAP is asymptotically valid for false discovery rate control, and show that these conditions are fulfilled in a range of applications. Numerical results demonstrate that existing methods can be much improved by the proposed framework.

This is a joint work with Professor Yin Xia from Fudan University and Professor Tony Cai from University of Pennsylvania.
