THE CHINESE UNIVERSITY OF HONG KONG

Department of Statistics

will present a seminar entitled

Large Scale Multiple Testing Based on Simultaneous Critical Values for t-tests

by

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on

Tuesday, 30 March 2010
2:00pm – 3:00pm

REVISED

in

Lady Shaw Building LT6
The Chinese University of Hong Kong

Abstract:

High-throughput screening has become an important mainstay for contemporary biomedical research. A standard approach is to use a large number of t-tests simultaneously and then select p-values in a manner that controls false discovery rate (FDR). Existing methods require very strong assumptions on the distribution of the data and the distribution of the p-values. We propose an asymptotically valid, data-driven procedure to find critical values for the t-statistics which requires minimal assumptions. A new asymptotically consistent estimate for the proportion of alternatives has been developed along the way. We demonstrate that our approach has improved computational efficiency and power over existing approaches while requiring fewer assumptions. The method controls the k-family wise error rate (k-FWER), the tail probability of false discovery proportion (FDTP) and false discovery rate (FDR). Simulation studies support our theoretical results and demonstrate the favorable performance of our new multiple testing procedure. We apply our method to analyze cancer microarray studies.

All are Welcome