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DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE
THE UNIVERSITY OF HONG KONG

Seminar

Dr. Yanyuan MA

Department of Statistics
Texas A&M University
U.S.A.

will give a talk

entitled

EFFICIENT DISTRIBUTION ESTIMATION FOR DATA WITH UNOBSERVED SUB-POPULATION IDENTIFIERS

Abstract

We study efficient nonparametric estimation of distribution functions of several scientifically meaningful sub-populations from data consisting of mixed samples where the sub-population identifiers are missing. Only probabilities of each observation belonging to a sub-population are available. The problem arises from quantitative trait locus (QTL) analysis and kin-cohort study where the scientific interest lies in estimating the cumulative distribution function of a trait given a specific genotype. However, the QTL genotypes in a QTL study or the genotypes of the relatives in the kin-cohort study are not directly observed. The distribution of the trait outcome is therefore a mixture of several genotype-specific distributions. We characterize the complete class of consistent estimators which includes members such as one type of nonparametric maximum likelihood estimator (NPMLE) and least squares or weighted least squares estimators. We identify the efficient estimator in the class that reaches the semiparametric efficiency bound, and we implement it using a simple procedure that remains consistent even if several components of the estimator are mis-specified. In addition, our close inspections on two commonly used NPMLEs in these problems show the surprising results that the NPMLE in one form is highly inefficient, while in the other form is inconsistent. We provide simulation procedures to illustrate the theoretical results and demonstrate the proposed methods through two real data examples. This is joint work with Yuanjia Wang.

on

Tuesday, January 11, 2011

2:00 p.m. – 3:00 p.m.

at

**Room 524, Meng Wah Complex
(behind the Chong Yuet Ming Amenities Centre)**

Visitors Please Note that the University has limited parking space. If you are driving please call the Department at 2859 2466 for parking arrangement.

All interested are welcome