

STATISTICS SEMINAR

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Master's Defense

Friday, April 27, 2012

Dickens 106 ~ 3:00 p.m.

Refreshments at 2:30 p.m. ~ Dickens 108



Minimum Hellinger Distance Estimation in a Semiparametric Mixture Model

Abstract

In this report, we introduce the minimum Hellinger distance (MHD) estimation method and review its history. We examine the use of Hellinger distance to obtain a new efficient and robust estimator for a class of semiparametric mixture models where one component has known distribution while the other component and the mixing proportion are unknown. Such semiparametric mixture models have been used in biology and the sequential clustering algorithm. Our new estimate is based on the MHD, which has been shown to have good efficiency and robustness properties. We use simulation studies to illustrate the finite sample performance of the proposed estimate and compare it to some other existing approaches. Our empirical studies demonstrate that the proposed MHD estimator works at least as well as some existing estimators for most of the examples considered and outperforms the existing estimators when the data are under contamination. A real data set application is also provided to illustrate the effectiveness of our proposed methodology.