Department of Biostatistics and Medical Informatics Seminar

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(https://stat.as.uky.edu/users/sha274)

Friday, October 13, 2023
12:00-1:00 pm
Biotechnology Center Auditorium
or via Zoom Link below

Nonparametric Finite Mixture: Applications in Overcoming Misclassification Bias

Abstract: In precision medicine, patients are classified into disease subtypes using biomarkers. The evaluation of treatments for the subtypes traditionally assumes that the biomarkers are accurate, which is seldom the case. The impact of diagnostic misclassification in statistical inference has been recently investigated in parametric model contexts and shown to introduce severe bias in estimating treatment effects and give grossly inaccurate inferences. The research presented in this talk aims to address these problems in a fully nonparametric setting. Methods for consistently estimating and testing meaningful yet nonparametric treatment effects are developed. Along the way, we construct estimators for misclassification error rates and investigate their asymptotic properties. The proposed methods are applicable for outcomes measured in ordinal, discrete, or continuous scales. They do not require any assumptions, such as the existence of moments. Simulation results show significant advantages of the proposed methods in bias reduction, coverage probability, and power. The applications of the proposed methods are illustrated with gene expression profiling of bronchial airway brushing in asthmatic and healthy control subjects.

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