

Nonparametric Finite Mixture: Applications in Contaminated Trials

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Room Benvenuti and live Zoom
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Investigating the differential effect of treatments in groups defined by patient characteristics is of paramount importance in personalized medicine. Group membership is typically determined by diagnostic devices or biomarkers, but such tools are not perfectly accurate. The impact of diagnostic misclassification or contamination in statistical inference has received only little attention in the literature. This work addresses the problem in a fully nonparametric setting. Nonparametric finite mixture is proposed for estimating and testing of meaningful yet nonparametric treatment effects. Consistent estimators and asymptotic distributions are provided for the misclassification error rates as well as treatment effects. Numerical examples show significant advantages of the proposed method in terms of bias reduction, coverage probability and power. The application of the proposed method is illustrated with data from asthma and sleep deprivation studies.