BIOSTATISTICS SEMINAR

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Higher Order Targeted Maximum Likelihood Estimation

Abstract: Asymptotic linearity and efficiency of targeted maximum likelihood estimators (TMLE) of target features of the data distribution relies on a a second order remainder being asymptotically negligible. However, in finite samples, the second order remainder can dominate the sampling distribution so that inference based on asymptotic normality would be anti-conservative.

We propose a new higher order (say k-th order) TMLE, generalizing the regular (first order) TMLE. We prove that it satisfies an exact linear expansion, in terms of efficient influence functions of sequentially defined higher order fluctuations of the target parameter, with a remainder that is a k+1-th order remainder. As a consequence, this k-th order TMLE allows statistical inference only relying on the k+1-th order remainder being negligible. We present the theoretical result as well as simulations for the second order TMLE for nonparametric estimation of the ATE, and of the integrated squared density.

September 2, 2021 **1301 McGavran-Greenberg Hall** **3:30-4:30 PM**

Zoom Link:
https://unc.zoom.us/j/93545206596?pwd=N1IKeVZjSFhuM2IhSDJCWjN3c21BUT09
Meeting ID: 935 4520 6596 Passcode: 823321

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