

R. Clifton Bailey Statistics Seminar Series

Finite Sample Simulation Based Switched Z-estimation (SwiZs) and inference

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Abstract: In this paper, we propose a class of simulation based estimators that are, in general, numerically simple to implement and fast to compute and also set suitable (and mild) conditions for consistency and finite sample bias reduction and coverage probability for inference. This class can be used in complex settings, including high dimensional ones (e.g p large relative to n), with regularized (shrinkage) methods and robust estimation and inference. The inferential framework is rooted in the one of indirect inference combined with Fisher's switching principle for inferential purposes. The links with other simulation based inferential methods such as the bootstrap and the approximated Bayesian computing are formally made and lead to the conclusion that SwiZs brings clear advantages in terms of computational efficiency, bias reduction and probability coverage, with finite (and small) sample sizes. Moreover, the SwiZs outperforms asymptotic correction methods designed for the same purposes. We illustrate the theoretical results by means of exact derivations and simulations in complex settings.