

The University of Chicago
Department of Statistics
Seminar

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“Inference Based on Total Variation Distance”

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ABSTRACT

We present a general method for testing and confidence set construction based on the total variance distance between a parametric model and the model with the parameter value equal to an asymptotically normal estimate with some rate of convergence. We derive the asymptotic distribution of the suitably normalized total variation distance, from which the critical values for testing are found. The tests based on the total variation distance are proved to be first order equivalent to the initial estimate. Second order expansions for the power at local alternatives are derived to investigate the advantages of the method over tests based on the initial estimate. These expansions are obtained from integrable Edgeworth expansions for the initial estimate and the total variation distance. Several examples and further numerics illustrate the new general method we propose.

The method is conceptually similar to the minimum distance methods, but no nonparametric distribution estimates are required in our analysis. The method is very general in principle. It applies to the two sample case. The multiparameter case is included in the main theorems.

The talk is based on ongoing work with two coauthors.
