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On asymptotically optimal confidence regions and tests for high-dimensional models

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(Submitted on 3 Mar 2013)

We propose a general method for constructing confidence intervals and statistical tests for single or low-dimensional components of a large parameter vector in a high-dimensional model. It can be easily adjusted for multiplicity taking dependence among tests into account. For linear models, our method is essentially the same as from \citet{zhangzhang11}: we analyze its asymptotic properties and establish its asymptotic optimality in terms of semiparametric efficiency. Our method naturally extends to generalized linear models with convex loss functions. We develop the corresponding theory which includes a careful analysis forGaussian, sub-Gaussian and bounded correlated designs.

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