

LARGE DEVIATION APPROXIMATIONS FOR MAXIMUM LIKELIHOOD ESTIMATORS

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Abstract: A large deviation expansion of the density of a maximum likelihood estimator is derived in the case of replications from a multivariate curved subfamily of a continuous exponential family. Apart from an exponentially decreasing term, the approximation deviates only by a relative error of order $O(n^{-1})$ from the true density in a fixed neighbourhood of the true parameter value. An example is given which shows an excellent tail approximation even for small n . The results are specialized to the multidimensional nonlinear normal regression models and it is shown that, in these models, the approximation may be improved to deviate only by an exponentially decreasing error term.

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