Title: Statistical inference based on saddlepoint approximations

Author: Radka Sabolová

Abstract: The saddlepoint techniques for M-estimators have proved to be very accurate and robust even for small sample sizes. Based on these results, saddlepoint approximations of density of regression quantile and saddlepoint tests on the value of regression quantile were derived, both in parametric and nonparametric setup. Among these, a test on the value of regression quantile based on the asymptotic distribution of averaged regression quantiles was also proposed and all these tests were compared in a numerical study to the classical tests. Finally, special case of Kullback-Leibler divergence in exponential family was studied and saddlepoint approximations of the density of maximum likelihood estimator and sufficient statistic were also derived using this divergence.