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Asymptotic properties of posterior distributions in nonparametric regression with non-Gaussian errors

Taeryon Choi

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Abstract We investigate the asymptotic behavior of posterior distributions in nonparametric regression problems when the distribution of noise structure of the regression model is assumed to be non-Gaussian but symmetric such as the Laplace distribution. Given prior distributions for the unknown regression function and the scale parameter of noise distribution, we show that the posterior distribution concentrates around the true values of parameters. Following the approach by Choi and Schervish (*Journal of Multivariate Analysis*, 98, 1969–1987, 2007) and extending their results, we prove consistency of the posterior distribution of the parameters for the nonparametric regression when errors are symmetric non-Gaussian with suitable assumptions.

Keywords Posterior consistency · Uniformly consistent tests · Kullback-Leibler divergence · Hellinger metric · Prior positivity · Symmetric density