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On confidence bands for multivariate nonparametric regression

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Abstract In a multivariate nonparametric regression problem with fixed, deterministic design asymptotic, uniform confidence bands for the regression function are constructed. The construction of the bands is based on the asymptotic distribution of the maximal deviation between a suitable nonparametric estimator and the true regression function which is derived by multivariate strong approximation methods and a limit theorem for the supremum of a stationary Gaussian field over an increasing system of sets. The results are derived for a general class of estimators which includes local polynomial estimators as a special case. The finite sample properties of the proposed asymptotic bands are investigated by means of a small simulation study.

Keywords Confidence bands · Rates of convergence · Multivariate regression · Nonparametric Regression · Uniform convergence