

Nonparametric and semiparametric regression models are useful statistical regression models to discover nonlinear relationships between the response variable and predictor variables. However, optimal efficient estimates for the nonparametric components in the models are biased which hinders the development of methods for further statistical inference. In this paper, based on the local linear fitting, we propose a simple bias reduction approach for the estimation of the nonparametric regression model. The new approach does not need to use higher-order local polynomial regression to estimate the bias, and hence avoids the double bandwidth selection and the design sparsity problems suffered by higher-order local polynomial fitting. It also does not inflate the variance. Hence it can be easily applied to complex statistical inference problems. We extend our new approach to varying coefficient models, and to estimate the variance function and to construct simultaneous confidence band for the nonparametric regression function. Simulations are carried out for comparisons with existing methods, and a real data example is used to investigate the performance of the proposed method.