

Automatic Model Structure Selection

by

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Abstract

Partial linear models provide good compromises between linear and nonparametric models. However, how to decide which covariates are linear and which are nonlinear is a long-standing problem and not completely solved yet. Two methods are commonly used in practice: the first method is based on hypotheses testing, which is theoretically challenging due to multiple nonparametric tests. The second method is preliminary screening based on univariate analysis such as scatter plots to decide the proper regression form for each term, which is kind of very ad hoc. In this paper, we tackle this problem by a unified estimation approach, which can automatically determine the linearity or nonlinearity of each covariate and estimate these consistently at the same time. Both theoretical and numerical properties of the proposed estimators are presented.