Journal of Applied Probability & Statistics Vol. **3**, No. 2, 211–226

A Simple and Effective Method for Variable Selection in Additive Models

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Abstract

Additive models have long been accepted as an extremely useful statistical tool in high dimensional data analysis. One of the most difficult problems with this tool, however, is variable selection. In this paper, we describe a new easy-to-implement method that can effectively detect significant variables in an additive model. We propose to test directly whether a predictor is significant. Our method requires two components: a model fitting method and a method for choosing thresholds. We use pseudo-spline (Hastie, 1996) for model fitting and wild bootstrap (Wu, 1986) for choosing thresholds. A simulation study and a real data analysis demonstrate the practical aspects of the new method.

Keywords: Additive model, pseudo-spline; GCV, wild bootstrap, variable selection.

2000 Mathematics Subject Classification: 62G05, 62J02.

This work was done while Xiaoming Wang was visiting the University of Alberta. It was funded in part by the Natural Sciences and Engineering Research Council of Canada, the Alberta Heritage Foundation for Medical Research, the Social Science Foundation of Ministry of Education of China (05JA910004), and "211 Program" from Shanghai University of Finance and Economics.