

**Wang, Lifeng; Li, Hongzhe; Huang, Jianhua Z.**

**Variable selection in nonparametric varying-coefficient models for analysis of repeated measurements.** (English) [Zbl 1286.62034](#)

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Summary: Nonparametric varying-coefficient models are commonly used for analyzing data measured repeatedly over time, including longitudinal and functional response data. Although many procedures have been developed for estimating varying coefficients, the problem of variable selection for such models has not been addressed to date. In this article we present a regularized estimation procedure for variable selection that combines basis function approximations and the smoothly clipped absolute deviation penalty. The proposed procedure simultaneously selects significant variables with time-varying effects and estimates the nonzero smooth coefficient functions. Under suitable conditions, we establish the theoretical properties of our procedure, including consistency in variable selection and the oracle property in estimation. Here the oracle property means that the asymptotic distribution of an estimated coefficient function is the same as that when it is known a priori which variables are in the model. The method is illustrated with simulations and two real data examples, one for identifying risk factors in the study of AIDS and one using microarray time-course gene expression data to identify the transcription factors related to the yeast cell-cycle process.

Reviewer: [Reviewer \(Berlin\)](#)

**MSC:**

[62G05](#) Nonparametric estimation

[62P10](#) Applications of statistics to biology and medical sciences; meta analysis

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functional response; longitudinal data; nonparametric function estimation; oracle property; regularized estimation

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