

## **Estimation, Analysis of Variance, and F-Tests for Partial Linear Models**

Li-Shan Huang

*University of Rochester, Rochester, NY, USA*

Using the asymptotic projection matrix for local linear regression by Huang and Chen (2006), we propose a new set of estimators for both parametric and nonparametric terms, analysis of variance inference, and  $F$ -type hypothesis testing procedures for partial linear models. The new parametric estimator achieves root- $n$  consistency without under-smoothing for the nonparametric part, and the new nonparametric estimate is in a form of a projection estimator. The ANOVA inference explicitly gives the proportion of variation explained by fitting a partial linear model and separates the contributions from the parametric and nonparametric components. The ANOVA inference is then utilized to construct semiparametric  $F$ -tests, which can be viewed as extensions from classical  $F$ -tests and are applicable to testing significance of the parametric or nonparametric terms, and a combination of both terms. Simulation results illustrate that the performance of the new estimators and semiparametric  $F$ -tests are comparable with alternative methods in practical applications.

[ Li-Shan Huang, Department of Biostatistics and Computational Biology, University of Rochester, 601 Elmwood Ave, Box 630, Rochester, NY 14642, USA; Lhuang@bst.rochester.edu]