Regression Analysis for a Functional Response

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Functional responses are encountered when units are observed over time. Although the whole function itself is not observed, a sufficiently large number of evaluations, as in common with modern recording equipment, are assumed to be available. Functional regression analysis relates the smooth functional response, y(t), to known covariates, x, by a linear combination of parameter functions beta(t), which are to be estimated. The model takes the standard form, y(t)=x^T*beta(t)+gamma(t). This approach provides an alternative to standard longitudinal data methods used in the biological sciences, where less and noisier data necessitate parametric modeling. The methodology is illustrated by an application in ergonomics.

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