

Minimax Estimation for Infinite Dimensional Exponential Family Models

by

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Abstract

Slope function estimation in functional ordinary linear regressions has been substantially studied recently, from both theoretical and practical aspects. We consider exponential family models whose canonical parameters are specified as a linear functional of an unknown infinite dimensional slope function b in an L^2 space. We established a minimax lower bound for estimation of B using L^2 loss, and also construct an estimator that achieves the minimax rate.

Our method adapts ideas from LeCam theory of equivalence of experiments to simplify the analysis of our estimator. The asymptotic equivalence theorem provides a powerful technique tool for general infinite dimensional estimation problems.

At last, we applied functional logistic regression model and our methodology to an interesting financial data.

This is joint work with David Pollard and Harrison H. Zhou.