

Measuring the Discrepancy of a Parametric Model via Local Polynomial Smoothing

Anouar El Ghouch¹, Marc G. Genton² and Taoufik Bouezmarni³

¹ Institut de Statistique, Université Catholique de Louvain, B-1348 Louvain-la-Neuve,

² Department of Statistics, Texas A&M University, College Station, TX 77843-3143, U.S.A.

³ Département de mathématiques, Université de Sherbrooke, Québec, Canada

Abstract

In the context of multivariate mean regression we propose a new estimator of the minimum L^2 -distance between the true but unknown regression curve and a given parametric family. The method is based on local polynomial averaging of residuals with a polynomial degree that increases with the dimension of the covariate. Under some weak assumptions we give a Bahadur-type representation of the estimated distance from which \sqrt{n} -consistency and asymptotic normality are derived for strongly mixing variables. We then show how to use the proposed method to measure the inadequacy of a given parametric model. We conclude with a simulation study that aims at checking the finite sample properties of these techniques.

KEY WORDS: Lack-of-fit ; Model misspecification; Multivariate local polynomial smoothing; Strong mixing sequences.