DEPENDENCE AND THE DIMENSIONALITY REDUCTION PRINCIPLE

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Abstract. Stone's dimensionality reduction principle has been confirmed on several occasions for independent observations. When dependence is expressed with ϕ-mixing, a minimum distance estimate $\hat{\theta}_n$ is proposed for a smooth projection pursuit regression-type function $\theta \in \Theta$, that is either additive or multiplicative, in the presence of or without interactions. Upper bounds on the L_1-risk and the L_1-error of $\hat{\theta}_n$ are obtained, under restrictions on the order of decay of the mixing coefficient. The bounds show explicitly the additive effect of ϕ-mixing on the error, and confirm the dimensionality reduction principle.

Key words and phrases: Additive and multiplicative regression model, dimensionality reduction, projection pursuit, Kolmogorov's entropy, minimum distance estimation, nonparametric regression, ϕ-mixing, rates of convergence.