Bayesian aspects of some nonparametric problems. (English summary)


Summary: “We study the Bayesian approach to nonparametric function estimation problems such as nonparametric regression and signal estimation. We consider the asymptotic properties of Bayes procedures for conjugate (=Gaussian) priors. We show that, as long as the prior puts nonzero measure on the very large parameter set of interest, the Bayes estimators are not satisfactory. More specifically, we show that these estimators do not achieve the correct minimax rate over norm bounded sets in the parameter space. Thus, all Bayes estimators for proper Gaussian priors have zero asymptotic efficiency in this minimax sense. We then present a class of priors whose Bayes procedures attain the optimal minimax rate of convergence. These priors may be viewed as compound, or hierarchical, mixtures of suitable Gaussian distributions.”

Reviewed by B. L. S. Prakasa Rao