

Minimax optimal rates of convergence for multicategory classifications *

Di-Rong Chen Xu You
Department of Applied Mathematics
Beijing Univ. of Aeronautics and Astronautics
Beijing 100083, P. R. China

January 17, 2005

Abstract

In the problem of classification (or pattern recognition), given a set of n samples, we attempt to construct a classifier g_n with small misclassification error. It is important to study the convergence rates of the misclassification error as n to infinity. It is known that such a rate can't exist for the set of *all* distributions. In this paper we obtain the optimal convergence rates for a class of distributions $\mathcal{D}^{(\lambda, \omega)}$ in multicategory classification and nonstandard binary classification.

Keywords : rate of convergence, error probability, modulus of continuity, multicategory classification.

2000 MR Subject Classification: 62C20, 62H30, 62G20, 41A46

*Research supported in part by NSF of China under grant 10171007. The work was partially done while the first author was visiting the Institute for Mathematical Sciences, National University of Singapore in 2003. The visit was supported by the Institute