



Convergence rate for predictive recursion estimation of finite mixtures

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Predictive recursion (PR) is a fast stochastic algorithm for nonparametric estimation of mixing distributions in mixture models. It is known that the PR estimates of both the mixing and mixture densities are consistent under fairly mild conditions, but currently very little is known about the rate of convergence. Here I first investigate asymptotic convergence properties of the PR estimate under model misspecification in the special case of finite mixtures with known support. Tools from stochastic approximation theory are used to prove that the PR estimates converge, to the best Kullback--Leibler approximation, at a nearly root- n rate. When the support is unknown, PR can be used to construct an objective function which, when optimized, yields an estimate the support. I apply the known-support results to derive a rate of convergence for this modified PR estimate in the unknown support case, which compares favorably to known optimal rates.

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