

STANFORD UNIVERSITY
DEPARTMENT OF STATISTICS
DEPARTMENTAL SEMINAR

4:15 p.m., Tuesday, April 4, 2006
Sequoia Hall Room 200
(Cookies at 3:45 in 1st Floor Lounge)

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Aggregation by mirror averaging

Given a collection of M different estimators or classifiers, we study the problem of convex or model selection type aggregation, i.e., we construct a new estimator or classifier, called aggregate, which is nearly as good as the best among them (or nearly as good as their best convex combination), with respect to a given risk criterion. We define our aggregate by mixing of the initial estimators with data-dependent weights which are computed by a simple recursive procedure called the mirror averaging algorithm. We show that the mirror averaging aggregate satisfies sharp oracle inequalities under some general assumptions. They improve in several cases inequalities known for batch methods and apply under weaker conditions, because they are not based on the techniques of empirical processes. The results allow one to construct in an easy on-line way sharp adaptive nonparametric estimators for several problems including regression, classification and density estimation.