PAC-Bayesian approach for kernel methods

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In this work on regression with Gaussian error, we study an agregation procedure relying on the exponential weigthing scheme described in Dalalyan and Tsybakov [1]. We obtain PAC-Bayes oracle inequalities in this context valid in both the fixed design case and the random design case. These inequalities are obtained by techniques derived from those described in Catoni [2] and Audibert [3]. We apply those results to the selection of an "optimal" window for Nadaraya-Watson type estimators and obtain a provably efficient estimator implemented with a MCMC-type algorithm similar to the one proposed by Dalalyan and Tsybakov [3].

Références :

[1] A. Dalalyan and A. Tsybakov, Sparse regression learning by aggregation and Langevin Monte-Carlo, in 22th Annual Conference on Learning Theory, COLT, 2009.

[2] O. Catoni, Statistical learning theory and stochastic optimization, ser. Lecture Notes in Mathematics. Lecture notes from the 31st Summer School on Probability Theory held in Saint-Flour, 2001.

[3] J.-Y. Audibert, Aggregated estimators and empirical complexity for least square regression, Ann. Inst. H. Poincaré Probab. Statist., vol. 40, no. 6, pp. 685-736, 2004.

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