

Gaussian model selection with unknown variance

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Observe a Gaussian vector Y the coordinates of which are independent with equal variance. Consider now the problem of estimating its mean s by model selection in a context where the variance is unknown (or at least, cannot be well estimated by an ad-hoc estimator). When the family of models consists of linear spaces, many penalized criteria, such as AIC, BIC and FPE, have been proposed. These are often used in practice to select an appropriate model among the family on which estimating s by least-squares. Unfortunately, little is known on the performances of the resulting estimator from a non-asymptotic point of view.

In this talk, we shall analyze the performances of these type of estimators with regard to the choice of the criterion and the complexity of the family. Besides, we shall introduce a new penalized criterion and study its performance for the variable selection problem, including the situation where the number of variables is not smaller than the dimension of Y .

This talk is based on a joint work with C. Giraud and S. Huet.