A Gaussian type concentration inequality for robust empirical mean with applications to statistics

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Abstract

We propose robust estimators of the mean of a probability measure P, called robust empirical mean. We show a Gaussian type concentration inequality for these estimators under the mild assumption that the variance of the marginal is finite.

We used these new estimators to revisit problems of aggregation with ℓ_1-penalty and of estimator selection. Some of these applications will be presented in the talk.

Our procedure is an elementary and easily computable alternative to recently studied concurrents as Pac-Bayesian or T-estimators. Contrary to the classical empirical mean, it does not require independence of the data or any boundedness assumptions.