**Department of Decision Sciences**

Statistics Seminar

# On the performance of the Lasso in terms of prediction loss


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12:30pm Room 3-E4-SR03 Via Rontgen 1 Milano


### Abstract

Although the Lasso has been extensively studied, the relationship between its prediction performance and the correlations of the covariates is not yet fully understood. In this talk, we give new insights into this relationship in the context of regression with deterministic design. We show, in particular, that the incorporation of a simple correlation measure into the tuning parameter leads to a nearly optimal prediction performance of the Lasso even when the elements of the dictionary are highly correlated. However, we also reveal that for moderately correlated dictionary, the performance of the Lasso can be mediocre irrespective of the choice of the tuning parameter. For the illustration of our approach with an important application, we deduce nearly optimal rates for the least-squares estimator with total variation penalty.


Joint work with M. Hebiri and J. Lederer


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