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SPRING 2016

Empirical Bayes Prediction under Check Loss

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Wednesday, April 27, 2016

3:30pm - 4:30pm, CHS 33-105A

Refreshments served at 3:00 PM in room 51-254 CHS

ABSTRACT:

We develop a new Empirical Bayes methodology for prediction under check loss in high-dimensional Gaussian models. The check loss is linear in the amount of underestimation or overestimation but the weights for these two linear segments differ. Asymmetric check losses often arise in scientific research problems and modern business applications. However, prediction under it differs in fundamental aspects from estimation or prediction under weighted-quadratic losses which were studied much in previous literature. We develop a new method for constructing uniformly efficient asymptotic risk estimates which are then minimized to produce effective linear shrinkage predictive rules. In calculating the magnitude and direction of shrinkage, our proposed predictive rules incorporate the asymmetric nature of the loss function and are shown to be asymptotically optimal. Using simulated data, we study the non-asymptotic performance of our method and obtain encouraging results.