

Dominique PICARD

Mercredi 22 juin 2005

Cours Statistiques

9h30 – 10h30 et 11h00 – 12h00

Statistical estimation, learning theory and wavelet expansions

The first part introduces the problem of statistical estimation linked with the notion of 'information' contained in the data. We emphasize the important notion of Fisher Information and the general notion of geometry of families of probability. We introduce the notions of minimax risk and bayesian point of view.

The second part of the lecture focuses on the problem of estimating a functional object. We give examples of minimax rates of convergence and provide algorithms using kernel methods with fixed bandwidths and expansions on orthogonal bases. We also introduce non linear methods, based either on the choice of the bandwidth parameter or on the thresholding of wavelet coefficients. We also introduce least favorable bayesian measures and nonparametric bayesian methods.

The third part concerns learning theory. We focus on the problem of learning a functional object and introduce the reproducing kernel methods. We also introduce methods linked with the theory of approximation of functions and prove that these methods will perform very well except on sets of very small probability.

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