Title: Convergence rate of a class of multivariate density estimators based on adaptive partitioning

Speaker: Linxi Liu
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Time & Place:
Wednesday, February 18, 2015, 4:00–5:00pm
Room 133 SMI
(Cookies & Coffee @ 3:30 in Rm 1210 MSC)

Abstract:

Density estimation is a fundamental problem in statistics. In this talk, we will introduce a non-parametric approach to multivariate density estimation. The estimators are piecewise constant density functions supported by binary partitions. The partition of the sample space is learned by maximizing the likelihood of the corresponding histogram on that partition. We analyze the convergence rate under general settings, and reach a conclusion that for a relatively rich class of density functions the rate does not directly depend on the dimension. We also apply this method to several special cases, including spatial adaptation, estimation of functions of bounded variation, and variable selection, and calculate the explicit convergence rates respectively. These results help us further understand under what circumstances, and for which density classes, this method would perform well. We further study concentration of the posterior distribution under a suitable prior, and demonstrate that the Bayesian method can overcome the difficulty of choosing the smoothing parameter.