STANFORD UNIVERSITY

DEPARTMENT OF STATISTICS

SPECIAL SEMINAR

4:15 p.m., Wednesday, December 8, 1999
Sequoia Hall Rm. 200

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An exponential family random scheme for non-parametric priors

For Bayesian semi- and non-parametric inference, we need a prior on a "large" class of distribution functions on the sample space; and in applications where we think of the data as continuous, we want a nonparametric prior which selects an absolutely continuous distribution function.

In this work we describe one way of constructiong a nonparametric prior with the required properties, based on the notion of "Feller-type approximation." Roughly speaking, we model the density of the data as a mixture of given densities. The components of the mixture have no unknown parameters and are related to the natural exponential family. The mixing weights and the number of components of the mixture (or the order of approximation) are unknown and have a prior distribution.

Applications include density estimation, estimating a mixing distribution and non parametric regression. A nice property of the proposed estimators is that the choice of the smoothing parameter is driven by the data through its posterior distributions. This is still work in progress and examples and results about consistency of the posterior will be restricted to the case of data in [0,1].

Joint work with Piero Veronese and Larry Wasserman.