**The University of Chicago**

**Department of Statistics**

**Seminar**

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## "Nonparametric Bayesian Classification"

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**Tuesday, January 29, 2002 at 11:00 AM**
**110 Eckhart Hall, 5734 S. University Avenue**

## ABSTRACT

A Bayesian approach to the classification problem is proposed in which random partitions play a central role. It is argued that the partitioning approach has the capacity to take advantage of a variety of large-scale spatial structures, if they are present in the unknown regression function $f_0$. An idealized one-dimensional problem is considered in detail. The proposed nonparametric prior is found to provide a consistent estimate of the regression function in the $\mathcal{L}^p$ topology, for any $1 \leq p < \infty$, and for arbitrary measurable $f_0 : [0,1] \to [0,1]$. An MCMC implementation is outlined and simulation experiments are conducted to show that the proposed estimate compares favorably with CART and bagged CART estimates. A generalized prior is discussed which employs a random Voronoi partition of the covariate-space. The resulting estimate displays promise on a two-dimensional problem, and extends with a minimum of additional computational effort to arbitrary metric spaces.

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