

The University of Chicago

Department of Statistics

Seminar Series

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**“Regression Trees and Regression Graphs:
Efficient Estimators for Generalized Additive Models”**

MONDAY April 18, 2005 at 4:00 PM
133 Eckhart Hall, 5734 S. University Avenue

Refreshments following the seminar in Eckhart 110.

ABSTRACT

Generalized Additive Models (GAM), introduced by Hastie and Tibshirani (1990), are a nice generalization of logistic and linear regression. We give the first efficient estimators for these models based on a modification of Regression Trees.

More precisely, we assume that the data is distributed according to a GAM:

$$E[y|x] = u(f_1(x_1) + f_2(x_2) + \dots + f_n(x_n)),$$

where the function u is a monotonic function and each f_i is an arbitrary function of the i^{th} attribute of x . The estimator is efficient in two senses: it outputs a function $h(x)$ with mean squared error $< \epsilon$ for arbitrarily small $\epsilon > 0$, and the amount of data and computational runtime required of the learning algorithm are polynomial in $1/\epsilon$, the dimension of the problem n , and bounds on the derivatives of the functions.