

STATISTICS COLLOQUIUM

FRIDAY, FEBRUARY 17, 2012

TALK: 11:00 A.M. — SCIENCE CENTER RM. 705

“Multivariate Convex Regression”

**Lauren Hannah
Statistical Science
Duke University**

ABSTRACT

Regression problems with a convexity constraint on the mean function are common in economics, financial engineering, operations research and electrical engineering. In a purely regression setting, convexity constraints can increase predictive accuracy compared to unconstrained regression. In a convex optimization setting, convex regression can be used to approximate objective functions and constraints. However, current convex regression methods are computationally infeasible for moderate to large problems in a multivariate setting. We introduce two new methods for multivariate convex regression, a Bayesian and a frequentist version. We give consistency results for both methods and show adaptive convergence rates for the Bayesian method. We apply the methods to value function approximation for sequential decision problems including response surface estimation and pricing American basket options.