

STANFORD UNIVERSITY
DEPARTMENT OF STATISTICS
JOINT STATISTICS/BIOSTATISTICS SEMINAR

4:15 p.m., Tuesday, April 13, 2004
Sequoia Hall Room 200
(Cookies at 3:45 in the 1st Floor Lounge)

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Confidence Sets for Nonparametric Regression, with application to Cosmology

Abstract:

In this talk, I will discuss recent work on constructing confidence balls for an unknown function in nonparametric regression problems. The goal is to construct confidence balls in a specified metric with (asymptotically) uniform coverage that can then be constrained by available side information. I'll describe two approaches. The first extends results by Beran and Dumbgen (1998) to wavelet bases and weighted L2 loss. The second, still in progress, constructs L^∞ confidence balls – confidence bands – that account for bias in a truncated basis expansion. Our approach follows Baraud (2002) in using a family of tests to select subspaces on which to construct the balls. I will demonstrate these methods through an analysis of the Cosmic Microwave Background spectrum, which is used by cosmologists to understand the physics of the early universe.

This is joint work with Larry Wasserman.