

# BINGHAMTON UNIVERSITY

## MATHEMATICAL SCIENCES COLLOQUIUM

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DATE: Thursday, October 4, 2001

TIME: 4:30-5:30 PM

PLACE: LN 2205

SPEAKER: David M. Mason (Department of Food and Resource Economics, University of Delaware)

TITLE: Bootstrapping the Student t-statistic

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### Abstract

Let  $X, X_i, i \geq 1$ , be independent, identically distributed random variables and denote the sample mean and sample variance, respectively,

$$\bar{X}_n = n^{-1} \sum_{i=1}^n X_i, \quad s_n^2 = \sum_{i=1}^n (X_i - \bar{X}_n)^2 / (n-1), \quad n \geq 2.$$

Consider the Student t-statistic

$$T_n = \frac{\sqrt{n} \bar{X}_n}{s_n}.$$

Giné, Götze and Mason (1997) proved that  $T_n$  converges in distribution to a standard normal random variable if and only if  $X$  is in the domain of attraction of a normal and  $EX = 0$ . We shall show that roughly the same holds true for the bootstrapped Student t-statistic  $T_n^*$ . In the process we shall disclose all the possible subsequential limiting laws of  $T_n^*$ . The proofs require a bag of amusing tricks. This is joint work with Qi-Man Shao.

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### REFRESHMENTS

4:00 To 4:25 PM

Kenneth W. Anderson

Memorial Reading Room