UNIVERSITY OF SYDNEY

SCHOOL OF MATHEMATICS AND STATISTICS

Statistics Seminar

Friday October 5, 2.00pm., Carslaw Lecture Room 173 (Level 1)

mathStatica: Mathematical Statistics with *Mathematica*

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Abstract

In this seminar, the computer algebra software package mathStatica is demonstrated. mathStatica is a completely general toolset for doing mathematical statistics with *Mathematica* (Version 4). mathStatica defines statistical operators for taking expectations, finding probabilities, deriving transformations of random variables and so on. Importantly, mathStatica is not tied to a set of pre-specified statical distributions. Rather, it is designed to derive statistics such as moments, cumulative distribution functions, characteristic functions, and other generating functions for user-defined distributions. mathStatica supports discrete and continuous distributions - univariate and multivariate. Applications of mathStatica to inference include estimation (moment unbiased, minimum variance unbiased, best unbiased, maximum likelihood: symbolic and numeric), curve-fitting (Pearson and Johnson systems, non-parametric kernels), asymptotics, decision theory and moment conversion formulae (for conversion between cumulants, raw moments, and central moments: univariate and multivariate). mathStatica accompanies the book Rose and Smith (forthcoming), Springer-Verlag.

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