Book Reviews

Helmert, R.: Edgeworth Expansions for Linear Combinations of Order Statistics. Mathematical Centre Tracts 105, Mathematisch Centrum Amsterdam 1982, 139 p., Dfl 17.85.

This monograph is a slightly revised version of the Ph. D. thesis of R. Helmers written at the Mathematisch Centre in Amsterdam.

The subject is the refinement of the central limit theorem for linear combinations of order statistics by estimating the speed of convergence and deriving valid asymptotic expansions for their distribution function.

The first chapter introduces Edgeworth expansions and describes the main tools used in the following proofs. It provides an interesting review of the literature on the asymptotic distribution of linear combinations of order statistics.

The second chapter contains the basis tools like estimation of moments and estimation of characteristic functions for "higher" frequencies beyond $n^{1/2}$ (n denotes the number of observations).

The non initiated reader will probably not recognize the importance of Lemma 2.1.2 in that chapter due to van Zwet, which deserves a few comments since it entails the validity of asymptotic expansions in this case (under generous assumptions on the smoothness and the moments of the score function).

In Chapter 4 the author works hard to reduce these conditions on the score function to a minimum, which is still sufficient to estimate about fifteen different types of remainder terms arising in the expansion of the characteristic function for frequencies below n^ϵ , $\epsilon < 1/2$.

The results of Chapter 4 in general do not apply to trimmed linear combinations of order statistics (scores c_{in} vanish for $i < \alpha n$ and $i > \beta n$, $0 < \alpha < \beta < 1$). In Chapter 5 Edgeworth expansions for these statistics are proved under more restrictive conditions on the distribution of the observations.

Chapter 3 contains a nice proof of the Berry-Esséen speed of convergence $O(n^{-1/2})$ in the Kolmogorov distance under weak conditions on the limiting score function and the distribution function of the observations.

In Chapter 6 these expansions are applied to compute the asymptotic deficiencies of first order efficient L-estimators for the center of symmetric distributions.

Finally, Chapter 7 contains finite sample Monte Carlo studies which indicate that the expansions derived are far superior to the normal approximations.

The monograph is clearly written and can be recommended to everyone interested in this field.

F. Götze, Köln

Ehrenberg, A.S.C.: A primer in data reduction. John Wiley & Sons, New York 1982, 305 S.,

This is a basic text in statistics avoiding most mathematics. It even says "Sum" instead of Σ and it is for non-specialists taking an introductory course in this subject. The book consists of the following six parts:

Part One deals with averages and measures of scatter. Part Two covers frequency distributions and probability. Part Three explains how statistical inferences (estimation, tests of significance) are made. Part Four discusses relationships between observed variables (such as correlation, regression, and factor analysis). Part Five shows how to make numbers, tables, and graphs easier to grasp. Part Six discussed the nature of description and explanation, and the design and interpretation of experiments and observational studies.

This book makes statistics come to life for the non-specialists who are not mathematically oriented. There is a Teacher's Guide to accompany the book under review which is available free of charge to lectures.

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