Book Reviews

Uhlmann, W.: Statistische Qualitätskontrolle. 2nd ed. Teubner Studienbücher Mathematik, Leitfäden der angewandten Mathematik und Mechanik, Band 7. B.G. Teubner, Stuttgart 1982, 292 p., DM 38.—.

The subjects discussed in this textbook are given by the chapter headings:

- (1) Wahrscheinlichkeitstheoretische Grundlagen (50 pp.)
- (2) Statistische Grundlagen (40 pp.)
- (3) Aufgaben und Methoden der statistischen Qualitätskontrolle (10 pp.)
- (4) Stichprobenpläne für ein qualitatives Merkmal (70 pp.)
- (5) Stichprobenpläne für ein quantitatives Merkmal (30 pp.)
- (6) Kontrollkarten (60 pp.)
- (7) Kontinuierliche Stichprobenpläne (20 pp.)

It was a pleasure reading in the book. The first reviewer, being a university statistician, likes the thoroughness and the fact that explanation and interpretations are well-formulated. The second reviewer, being a student in statistics, experienced that the book was very useful during a training period in industry.

The following subject seems well-motivated. Choosing a sampling scheme, e.g. a sample size n and a cut-off point c in simple random sampling, requires that certain constants are specified, e.g. two points on the OC function or an indifference point together with a slope. The author obviously likes to base these choices on more fundamental ones concerning losses of unjustified approval or disapproval, and costs of making observations. Within the class of procedures of interest, e.g. simple random sampling schemes, he constructs the minimax regret procedure. In this respect it is of some theoretical interest to notice that Bayesian optimality (in the sense of minimizing the area under the regret function) can be achieved, among all sequential procedures, by applying backward induction.

Though the first reviewer missed some references to martingales, optimal stopping etc. and the second reviewer missed an introductory discussion of the CUSUM technique, they both are of the opinion that the book is a very nice textbook.

W. Schaafsma, and J. van der Werff, Groningen

Does, R.J.M.M.: Higher Order Asymptotics For Simple Linear Rank Statistics. Mathematical Centre Tracts 151, Mathematisch Centrum, Amsterdam 1982, 91 p., Dfl 11.55.

This booklet can be regarded as a collection of three different articles of R.J.M.M. Does. It is concerned with Berry-Esseen type theorems and Edgeworth type expansions of length three of simple linear rank statistics.

The proofs of the different results run within the usual framework; that is, after an application of Esseen's smoothing lemma one has to establish bounds of characteristic functions. The decisive tool in every proof is a lemma due to van Zwet who obtained upper bounds for characteristic functions of centered simple linear rank statistics at arguments between $\log N$ and $N^{3/2}$.

Chapter 2 is devoted to the problem of establishing rates of order $O(N^{-1/2})$ of the normal approximation to the distribution function of simple linear rank statistics in the case of independent and identically distributed random variables. The result is proved for differentiable scores generating function J . It is notable that J is allowed to tend to infinity in the neighborhood of 0 and 1 at a certain rate.

The chapters 3 and 4 deal with asymptotic expansions of simple linear rank statistics under certain conditions on the third derivative of the scores generating function. The expansions are established in the case of identically as well as non-identically distributed random variables. The results can be useful to adjust the critical value of distribution-free test procedures and to compute the power function at contiguous location alternatives.

The booklet also contains several historical remarks, comparisons of the present results to previous ones and, moreover, some numerical computations.

R. Reiß, Siegen