Book review

Büning, Herbert: *Robuste und adaptive Tests*. Walter de Gruyter, Berlin, 1991.

x + 339 p.

The monograph gives a review of some robust and some adaptive tests. The prospected audience are theoretical and practical statisticians. In the Hájek and Šidak (1967) manner, the book is divided by one-, two-, and c-sample cases and by location and scale problems (scale may sometimes be reduced to location by Levene's (1960) principle).

The book is largely a review. There are hardly any proofs. The reviewer discovered just two four-line proofs: One is the transformation of the influence curve of one-sample linear rank statistics to the unit interval (page 79), the other one is Hogg's (1974) argument for distribution freeness (page 219). The basic instrument are computer simulations of the size and power of tests.

Chapter 1 starts with a few real data examples. The data in the rest of the book are simulated from certain distributions. The distributional models are parametric: the Pearson, Box-Tiao, and RST families with 4 parameters; and they are depicted on page 23. The four moments: mean, variance, and skewness and kurtosis, play an important role for the author. Consequently, on page 58 he considers ε -contaminated normals (both components normal) with prescribed moments. Lévy-metric is introduced on page 26 (in which, however, the moments are not continuous).

Chapter 2 on robustness is concerned with robustness of validity and robustness of efficiency. These measures—(relative) change of level and power at a fixed sample size—can in most cases be evaluated only by simulation. Concepts like: qualitative robustness, breakdown point, influence curve, infinitesimal robustness, are mentioned and depicted on page 32. The Neyman-Pearson lemma for capacities is not mentioned.

As for robust procedures, the author prefers the classical rank tests, Winsorizing and trimming. Consequently, also multivariate versions of trimming are described. M -estimates and corresponding test statistics are mentioned marginally on page 83. The exact finite-sample minimax test based on Huber-Strassen (1973) is not considered. While computers are enough justification for many simulations, they are not used to solve M -equations. Are the omitted concepts and results part of the "abundance of superfluous theoretical publications" (page 24)?

Chapter 3 on adaptive tests concentrates on the work by R.V. Hogg. A selector statistic chooses among a finite number of (nonadaptive) rank tests. The selector statistic is based on the order statistics and estimates skewness, kurtosis, and peakedness. Results are obtained by simulation.

An **Appendix** defines moments and cumulants, states the law of large numbers and the Lindeberg-Lévy central limit theorem, and concludes by the Edgeworth-expansion (where skewness and kurtosis occur in the coefficients).

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