

## RESEÑAS / BOOK REVIEWS

### **RANKED SET SAMPLING: THEORY AND APPLICATIONS**

Zehua Chen, Zhidong Bai, and Bimal K. Sinha (2004)

Springer-Verlag

XII+224

USD 59,95

ISBN 0-387-40263-2.

This book has been welcome by the statisticians as it is the first book giving a detailed exposition of ranked set sampling (RSS). This method solves many problems present in different applications, but mainly in those appearing in environmental research. Commonly, to evaluate the variables in the experimental units is not only too expensive but there is also additional information on them that is misused. In traditional sampling it is used for fitting superpopulations models or an unequal probability design. RSS was proposed in 1952 by McIntire (A method of unbiased selective sampling using ranked sets. *J. Agric. Res.* 3, 385-390) but it has been discovered by statisticians as a good source for designing surveys recently. The importance of it and the literature in the theme are growing and to have a book where the main results are presented in a systematic way is necessary. This book plays this role, and is the first one. Recent review papers have been published see for example Muttlak and Al-Saleh (2000, H.A. and M.F. Al-Saleh (2000, Recent Developments in Ranked Set Sampling. *J. Applied Stat. Sc.* 10, 269-290.), Bouza (2005, Sampling Using Ranked Sets: Concepts, Results and Perspectives. *Rev. Investigación Operacional* 3, 180-193).

Its 8 chapters are clustered into 2 parts. The first chapter presents the basics of the RSS procedure: historical clues, some successful applications of it etc. Chapters 2-7 present the theory of RSS mathematically or by using simulation studies. They sustain that RSS is to be preferred to simple random sampling. The basic statistical results which play a key role in the theory of RSS are systematically discussed. The needed nonparametric inferential results for univariate random variables, some of them are supported by a lot of theorems and results in the specialized books and papers of non parametric, are highlighted. Take the results on order statistics and their moments, for example. Using them the statistical properties of estimators can be deduced considering that there is a ranking mechanism satisfying a set of mild hypotheses. They are devoted to discuss the different well documented RSS alternatives. Then, aspects of balanced RSS are established, information theory is used to sustain that RSS provides more information than a simple random sample, for the same sample size, particular procedures as median, extreme RSS and others are discussed at large..

Finally chapter 8 surveys important applications of RSS which are motivating for further research in different areas..

The authors are well established experts in the field of RSS. As quoted previously this is an invaluable book in sampling both for theoreticians and practitioners.

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### **COOPERATIVE AND NONCOOPERATIVE MULTI-LEVEL PROGRAMMING**

Masatoshi Sakawa and Ichiro Nishizaki (2009)

OPERATIONS RESEARCH/ COMPUTER SCIENCE INTERFACES Volume: 48

Springer

X+ 250

EUR 99,95

ISBN: 978-1-4419-0675-5

The authors are well known by their contributions in the application of cooperative and no cooperative decision making, genetic algorithms, systems engineering and particularly in multiobjective decision making, fuzzy mathematical programming and game theory. Then it is not a surprise to have a superb monograph. Its content is divided in 5 chapters (. Introduction, Optimization Concepts and Computational Methods, Noncooperative Decision Making in Hierarchical Organizations, Cooperative Decision Making in Hierarchical Organizations, Some applications). A review of classic optimization is provided and they are applied to no cooperative decision

making in hierarchical organizations, two-level linear programming under fuzzy, multiobjective as well as under different sources of uncertainty. A discussion on how optimization uses exact solution methods, and they are overcome by the complexity of many real world problems, and how the use of genetic algorithms is a solution, gives light to the specialists involved with applications. Some real life problems are presented and discussed. They come from labour force assignment, transportation purchase for food retailing problems.

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