

EMPIRICAL PROCESSES WITH APPLICATIONS TO STATISTICS.

G.R. Shorack and J.A. Wellner. New York: Wiley, 1986, pp. xxxvii + 938, £57.45/US\$60.00.

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Readership: Probabilists, mathematical statisticians

This is a very good book, and a timely one. It is about 50 years since Kolmogorov introduced the statistic which bears his name, and began a literature on the empirical distribution function and empirical process which has over the years become a torrent. This book contains an impressive coverage of this literature.

A logical development of the theory of the empirical and related processes is given, with care-

ful attention to rigour except where the authors state otherwise (and then a reference is usually given). It is set out to be given as a graduate course, and a useful flowchart shows the connections between chapters. A thorough knowledge of modern probability theory and techniques is essential; these are carefully presented at the beginning. Basic ideas discussed include those of weak convergence, the Skorokhod construction of processes, and various representations of processes, with these tools the complete behaviour of the processes is discussed in subsequent chapters.

Many of the most important statistical uses of the processes are surveyed, including goodness-of-fit tests, uses of spacings, rank tests, linear combinations of order statistics, and the bootstrap. These themselves have a vast literature, and the abridged account given naturally reflects the authors' interests. Asymptotic results are usually covered well: often, useful tables are included. Practical details such as power results are less fully treated, but a brief guide is often given.

The style is clear and crisp, with helpful comments to guide one through a long proof, or interesting cross-reference to other sections of the book. Unfortunately neither the sections nor the page headings reveal the chapter, so that it is difficult, especially in a book of nearly one thousand pages, to trace back to earlier sections. This oversight on the part of the publisher mars an otherwise excellent and clear presentation. It is partly offset, but not enough, by an extremely detailed contents, eighteen pages; the list given here is the abridged version. This book will be very useful to probabilists, and to mathematical statisticians interested in the theory of many areas of statistical practice.

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