Serfling, Robert J.
Approximation theorems of mathematical statistics. (English) ┃Zbl 1001.62005┃
Wiley Series in Probability and Statistics. New York, NY: Wiley. 371 p. (2002).

This is a paperback edition of the successful textbook on asymptotic methods in mathematical statistics published in 1980, see the review Zbl 0538.62002. It covers a broad range of limit theorems useful in mathematical statistics along with methods of proofs and techniques of applications. The basic setup is a random sample of size n from a distribution function F, e.g., n independent, identically distributed random variables, each of them having distribution function F; no dependent observations or regression situations are investigated.

The book is divided into 10 chapters. Chapter 1 contains a survey of basic ideas, notions and theorems from probability theory. Chapter 2 investigates systematically usual statistics computed from samples including their asymptotic properties, e.g., sample moments, sample quantiles. Chapter 3 treats asymptotics of statistics that arise from transformations of some basic statistics.

Chapter 4 concerns estimation and hypothesis testing in a parametric setup with emphasis on likelihood related methods and related limit properties. Chapters 5-9 are devoted to important special classes of statistics. Particularly, Chapter 5 is devoted to U-statistics, Chapter 6 concerns von Mises differentiable functionals, while Chapter 7 does M-estimates, Chapter 8 concerns L-estimates and Chapter 9 deals with rank based statistics. Chapter 10 presents a survey of approaches toward asymptotic relative efficiency of statistical test procedures.

A number of examples illustrates the theoretical results and together with the exercises provide better insight into the assertions and also better understanding of the basic ideas of the techniques of proofs. As a prerequisite a one semester course on probability theory and one semester on mathematical statistics at a graduate level are assumed.

I think that despite the book was written more than 20 years ago, even today it still provides a really good introduction into asymptotic statistics. It is quite often used as a reference book. The book provides useful material both for students and professionals in statistics, operations research, mathematicians, etc.

Reviewer: Marie Huškova (Praha)

MSC:

62-02	Research exposition (monographs, survey articles) pertaining to statistics
62E20	Asymptotic distribution theory in statistics
62G20	Asymptotic properties of nonparametric inference
62F05	Asymptotic properties of parametric tests
62F12	Asymptotic properties of parametric estimators

Cited in **58** Documents

Keywords:

textbook; asymptotic methods; asymptotic statistics