图书基本信息

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内容概要

本书讲述了学习独立同分布随机变量和向量的极值现象的数学背景和随机过程技巧。 重在强调极值的三个重要的话题,规则变化函数的解析理论,点过程和随机测度的概率论,度量空间 概率测度的若收敛的渐进分布逼近之间的联系。 目次:基础;吸引域和规范常数;收敛的质量;记录和极过程;多变量极值。

书籍目录

Preface Preliminaries Uniform Convergence **Inverses of Monotone Functions** Convergence to Types Theorem and Limit Distributions of Maxima Regularly Varying Functions of a Real Variable Basics Deeper Results ; Karamata ' S Theorem Extensions of Regular Variation: 兀. Variation . F. Variation Domains of Attraction and Norming Constants Domain of Attraction of A(x) = expDomain of Attraction Domain of Attraction Von Mises Conditions Equivalence Classes and Computation of Normalizing Constants Quality of Convergence Moment Convergence Density Convergence Large Deviations. Uniform Rates of Convergence to Extreme Value Laws Uniform Rates of Convergence Uniform Rates of Convergence Point Processes **Fundamentals** Laplace Functionals **Poisson Processes** Definition and Construction Transformations of Poisson Processes Vague Convergence Weak Convergence of Point Processes and Random Measures **Records and Extrema Processes** Structure of Records Limit Laws for Records **Extremal Processes** Weak Convergence to Extremal Processes Skorohod Spaces Weak Convergence of Maximal Processes to Extremal Processes via Weak Convergence of Induced Point Processes Extreme Value Theory for Moving Averages Independence of k-Record Processes Multivariate Extremes Max . Infinite Divisibility An Example : The Bivariate Normal Characterizing Max . id Distributions Limit Distributions for Multivariate Extremes Characterizing Max . Stable Distributions



Domains of Attraction ; Multivariate Regular Variation Independence and Dependence Association Refe Inde

章节摘录

Extreme value theory is an elegant and mathematically fascinating theory aswell as a subject which pervades an enormous variety of applications. Consider the following circumstances : Air pollution monitoring stations are located at various sites about a city. Government regulations mandate that pollution cOncentratiOns measuredat each site be below certain specified levels. A skyscraper iS to be built near Lake Michigan and thus will be subject towind stresses from several directions. Design strength must be SHfficientto withstand these winds. Similarly.a mechanical component such as anairplane wing must be designed to withstand stresses from several sources. Dams or dikes at locations along a body of Water such as a river or sea mustbe built high enough to exceed the maximum water height. A mining company drills core samples at points of a grid in a given region. Continued drilling will take place in the direction of maximum ore con.centration.Athletic records are frequently broken.A common feature of these situations iS that observational data has been or can be collected and the features of the observations of most interest dependon largest or smallest values; i...e on the extremes. The data must be modeled and decisions made on the basis of how one believes the extreme values willbehave. This book iS primarily concerned with the behavior of extreme values of independent, identically distributed fiidl observations. Within the iid frame. work there are surprising depth, beauty, and applicability. The treatment in this book is organized around two themes. The first iS that the central analytictool of extreme value theory is the theory of regularly varying functions, and the second iS that the central probabilistic tool iS point process theory and in particular the Poisson process. Accordingly we have presented a careful exposition of those aspects of regular variation and point processes which are essential for a proper understanding of extreme value theory.

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