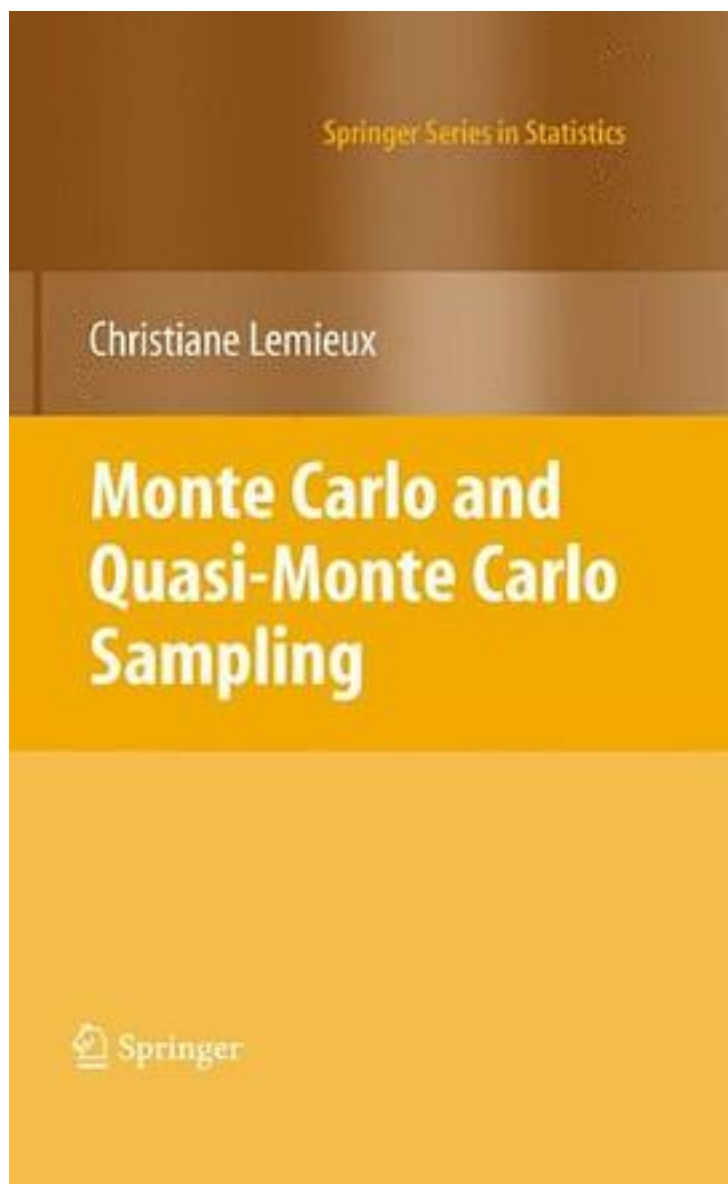


Monte Carlo and Quasi-Monte Carlo Sampling



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Quasi-Monte Carlo methods have become an increasingly popular alternative to Monte Carlo methods over the last two decades. Their successful implementation on practical problems, especially in finance, has motivated the development of several new research areas within this field to which practitioners and researchers from various disciplines currently contribute. This book presents essential tools for using quasi-Monte Carlo sampling in practice. The first part of the book focuses on issues related to Monte Carlo methods-uniform and non-uniform random number generation, variance reduction techniques-but the material is presented to prepare the readers for the next step, which is to replace the random sampling inherent to Monte Carlo by quasi-random sampling. The second part of the book deals with this next step. Several aspects of quasi-Monte Carlo methods are covered, including constructions, randomizations, the use of ANOVA decompositions, and the concept of effective dimension. The third part of the book is devoted to applications in finance and more advanced statistical tools like Markov chain Monte Carlo and sequential Monte Carlo, with a discussion of their quasi-Monte Carlo counterpart. The prerequisites for reading this book are a basic knowledge of statistics and enough mathematical maturity to follow through the various techniques used throughout the book. This text is aimed at graduate students in statistics, management science, operations research, engineering, and applied mathematics. It should also be useful to practitioners who want to learn more about Monte Carlo and quasi-Monte Carlo methods and researchers interested in an up-to-date guide to these methods.

作者介绍:

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