



Random and Quasi-Random Point Sets

By Hellekalek, Peter / Larcher, Gerhard

Book Condition: New. Publisher/Verlag: Springer, Berlin | This volume is a collection of survey papers on recent developments in the fields of quasi-Monte Carlo methods and uniform random number generation. We will cover a broad spectrum of questions, from advanced metric number theory to pricing financial derivatives. The Monte Carlo method is one of the most important tools of system modeling. Deterministic algorithms, so-called uniform random number generators, are used to produce the input for the model systems on computers. Such generators are assessed by theoretical ("a priori") and by empirical tests. In the a priori analysis, we study figures of merit that measure the uniformity of certain high-dimensional "random" point sets. The degree of uniformity is strongly related to the degree of correlations within the random numbers. The quasi-Monte Carlo approach aims at improving the rate of convergence in the Monte Carlo method by number-theoretic techniques. It yields deterministic bounds for the approximation error. The main mathematical tool here are so-called low-discrepancy sequences. These "quasi-random" points are produced by deterministic algorithms and should be as "super" uniformly distributed as possible. Hence, both in uniform random number generation and in quasi-Monte Carlo methods, we study the uniformity of...



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