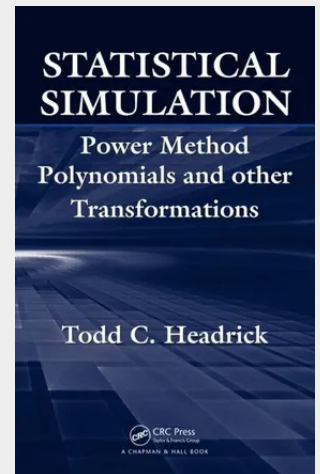


Statistical Simulation

Although power method polynomials based on the standard normal distributions have been used in many different contexts for the past 30 years, it was not until recently that the probability density function (pdf) and cumulative distribution function (cdf) were derived and made available. Focusing on both univariate and multivariate nonnormal data generation, *Statistical Simulation: Power Method Polynomials and Other Transformations* presents techniques for conducting a Monte Carlo simulation study. It shows how to use power method polynomials for simulating univariate and multivariate nonnormal distributions with specified cumulants and correlation matrices. The book first explores the methodology underlying the power method, before demonstrating this method through examples of standard normal, logistic, and uniform power method pdfs. It also discusses methods for improving the performance of a simulation based on power method polynomials. The book then develops simulation procedures for systems of linear statistical models, intraclass correlation coefficients, and correlated continuous variates and ranks. Numerical examples and results from Monte Carlo simulations illustrate these procedures. The final chapter describes how the g-and-h and generalized lambda distribution (GLD) transformations are special applications of the more general multivariate nonnormal data generation approach. Throughout the text, the author employs Mathematica® in a range of procedures and offers the source code for download online. Written by a longtime researcher of the power method, this book explains how to simulate nonnormal distributions via easy-to-use power method polynomials. By using the methodology and techniques developed in the text, readers can evaluate different transformations in terms of comparing percentiles, measures of central tendency, goodness-of-fit tests, and more.



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