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Nota di contenuto	Intermediate Probability; Chapter Listing; Contents; Preface; Part I Sums of Random Variables; 1 Generating functions; 1.1 The moment generating function; 1.1.1 Moments and the m.g.f.; 1.1.2 The cumulant generating function; 1.1.3 Uniqueness of the m.g.f.; 1.1.4 Vector m.g. f.; 1.2 Characteristic functions; 1.2.1 Complex numbers; 1.2.2 Laplace transforms; 1.2.3 Basic properties of characteristic functions; 1.2.4 Relation between the m.g.f. and c.f.; 1.2.5 Inversion formulae for mass and density functions; 1.2.6 Inversion formulae for the c.d.f.; 1.3 Use of the fast Fourier transform 1.3.1 Fourier series1.3.2 Discrete and fast Fourier transforms; 1.3.3 Applying the FFT to c.f. inversion; 1.4 Multivariate case; 1.5 Problems; 2 Sums and other functions of several random variables; 2.1 Weighted sums of independent random variables; 2.2 Exact integral expressions for functions of two continuous random variables; 2.3 Approximating the mean and variance; 2.4 Problems; 3 The multivariate normal distribution; 3.1 Vector expectation and variance; 3.2 Basic properties of the multivariate normal; 3.3 Density and moment generating

function; 3.4 Simulation and c.d.f. calculation
 3.5 Marginal and conditional normal distributions
 3.6 Partial correlation;
 3.7 Joint distribution of X and S^2 for i.i.d. normal samples; 3.8 Matrix algebra; 3.9 Problems; Part II Asymptotics and Other Approximations; 4 Convergence concepts; 4.1 Inequalities for random variables; 4.2 Convergence of sequences of sets; 4.3 Convergence of sequences of random variables; 4.3.1 Convergence in probability; 4.3.2 Almost sure convergence; 4.3.3 Convergence in r-mean; 4.3.4 Convergence in distribution; 4.4 The central limit theorem; 4.5 Problems; 5 Saddlepoint approximations; 5.1 Univariate
 5.1.1 Density saddlepoint approximation
 5.1.2 Saddlepoint approximation to the c.d.f.; 5.1.3 Detailed illustration: the normal-Laplace sum; 5.2 Multivariate; 5.2.1 Conditional distributions; 5.2.2 Bivariate c.d.f. approximation; 5.2.3 Marginal distributions; 5.3 The hypergeometric functions ${}_1F_1$ and ${}_2F_1$; 5.4 Problems; 6 Order statistics; 6.1 Distribution theory for i.i.d. samples; 6.1.1 Univariate; 6.1.2 Multivariate; 6.1.3 Sample range and midrange; 6.2 Further examples; 6.3 Distribution theory for dependent samples; 6.4 Problems; Part III More Flexible and Advanced Random Variables
 7 Generalizing and mixing
 7.1 Basic methods of extension; 7.1.1 Nesting and generalizing constants; 7.1.2 Asymmetric extensions; 7.1.3 Extension to the real line; 7.1.4 Transformations; 7.1.5 Invention of flexible forms; 7.2 Weighted sums of independent random variables; 7.3 Mixtures; 7.3.1 Countable mixtures; 7.3.2 Continuous mixtures; 7.4 Problems; 8 The stable Paretian distribution; 8.1 Symmetric stable; 8.2 Asymmetric stable; 8.3 Moments; 8.3.1 Mean; 8.3.2 Fractional absolute moment proof I; 8.3.3 Fractional absolute moment proof II; 8.4 Simulation; 8.5 Generalized central limit theorem
 9 Generalized inverse Gaussian and generalized hyperbolic distributions

Sommario/riassunto

Intermediate Probability is the natural extension of the author's Fundamental Probability. It details several highly important topics, from standard ones such as order statistics, multivariate normal, and convergence concepts, to more advanced ones which are usually not addressed at this mathematical level, or have never previously appeared in textbook form. The author adopts a computational approach throughout, allowing the reader to directly implement the methods, thus greatly enhancing the learning experience and clearly illustrating the applicability, strengths, and weaknesses of the theor