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Kurtosis; 2.5 CORRECTIONS FOR GROUPING; 3 Basic Concepts and Models; 3.1 INTRODUCTION; 3.2 THE DISTRIBUTION FUNCTION; 3.3 THE CHARACTERISTIC FUNCTION; 3.3.1 Definition; 3.3.2 Fourier Series; 3.3.3 Independence and Convolution; 3.4 MOMENTS AND MEASURES OF LOCATION AND DISPERSION; 3.4.1 Trigonometric Moments; 3.4.2 Measures of Location and Dispersion; 3.4.3 A Chebyshev Inequality; 3.4.4 Symmetrical Distributions; 3.5 CIRCULAR MODELS; 3.5.1 Introduction; 3.5.2 Lattice Distributions; 3.5.3 Uniform Distribution; 3.5.4 Von Mises Distributions; 3.5.5 Cardioid Distributions; 3.5.6 Projected Normal Distributions; 3.5.7 Wrapped Distributions; 3.6 MULTIPLY-WRAPPED DISTRIBUTIONS; 3.6.1 Wrapping the Circle onto Itself; 3.6.2 Mixtures; 3.7 DISTRIBUTIONS ON THE TORUS AND THE CYLINDER; 3.7.1 Distributions on the Torus; 3.7.2 Distributions on the Cylinder; 4 Fundamental Theorems and Distribution Theory; 4.1 INTRODUCTION; 4.2 PROPERTIES OF CHARACTERISTIC FUNCTIONS; 4.2.1 Key Properties; 4.2.2 Polar Distributions and Characteristic Functions; 4.2.3 Further Properties of the Characteristic Function; 4.3 LIMIT THEOREMS; 4.3.1 Central Limit Theorems; 4.3.2 Poincaré's Theorem; 4.4 THE DISTRIBUTION OF θ AND R FROM THE UNIFORM DISTRIBUTION; 4.4.1 The Distribution of θ and R ; 4.4.2 The Distribution of C and S ; 4.5 DISTRIBUTION OF C , S AND R FOR A VON MISES POPULATION; 4.5.1 The Joint Distribution of C and S ; 4.5.2 Distributions of θ and R ; 4.5.3 Marginal Distributions of C and S ; 4.6 PROBLEMS FOR VON MISES POPULATIONS; 4.6.1 The Distribution of R ; 4.6.2 The Joint Distribution of (R, θ) ; 4.6.3 Distributions for the Homogeneous Case; 4.7 MOMENTS OF R ; 4.8 LIMITING DISTRIBUTIONS OF CIRCULAR STATISTICS; 4.8.1 Large-Sample Approximations; 4.8.2 High-Concentration Approximations; 4.8.3 Further Approximations to the Distribution of R ; 5 Point Estimation; 5.1 INTRODUCTION; 5.2 UNBIASED ESTIMATORS AND A CRAMER-RAO BOUND

Sommario/riassunto

Presents new and up-dated material on both the underlying theory and the practical methodology of directional statistics, helping the reader to utilise and develop the techniques appropriate to their work. The book is divided into three parts. The first part concentrates on statistics on the circle. Topics covered include tests of uniformity, tests of good-of-fit, inference on von Mises distributions and non-parametric methods. The second part considers statistics on spheres of arbitrary dimension, and includes a detailed account of inference on the main distributions on spheres. Recent mat