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Applied Compositional Data Analysis

With Worked Examples in R

Series: Springer Series in Statistics

- Fills the gap in the existing literature by providing a practical approach to compositional data analysis
- Presents a concise and easy-to-interpret methodology which guarantees a scale invariant analysis of data carrying relative information
- Uses the log-ratio approach, including various aspects of data processing
- Includes numerous real-world examples with implementations in R from a wide range of applications

This book presents the statistical analysis of compositional data using the log-ratio approach. It includes a wide range of classical and robust statistical methods adapted for compositional data analysis, such as supervised and unsupervised methods like PCA, correlation analysis, classification and regression. In addition, it considers special data structures like high-dimensional compositions and compositional tables. The methodology introduced is also frequently compared to methods which ignore the specific nature of compositional data. It focuses on practical aspects of compositional data analysis rather than on detailed theoretical derivations, thus issues like graphical visualization and preprocessing (treatment of missing values, zeros, outliers and similar artifacts) form an important part of the book. Since it is primarily intended for researchers and students from applied fields like geochemistry, chemometrics, biology and natural sciences, economics, and social sciences, all the proposed methods are accompanied by worked-out examples in R using the package robCompositions.

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