

BIBLIOGRAPHIE

H. ROUANET and B. LE ROUX, *Analyse des Données Multidimensionnelles*, Paris, Dunod, 1993¹.

This is a book about exploratory data analysis, and specifically about multidimensional graphical methods. The intention of the authors, as described in the preface, is to provide a unified presentation of a number of important classical multidimensional graphical methods using a geometrical and formal approach.

The book, which grew out of a course of lectures presented by the authors to students in mathematical and social sciences, is intended for students and teachers, and more generally for anybody wishing to use multidimensional graphical methods in social sciences.

The style is that of a text book with a wealth of practical examples and case-studies illustrating the definitions and the methods described in the text.

Each chapter is organized in the same manner : a lecture-style presentation of the subject matter followed by substantial sets of exercises with solutions. These exercises include both theoretical and practical problems. At the end of each chapter are notes providing geometrical and algebraic concepts required for the chapter.

This work, representative of the Benzécri school of data analysis, makes wide use of all the characteristics of this approach: notations, the importance of objects, duality...

The book consists of 9 chapters which can be grouped into three main parts:

Part 1. After the presentation of a short example, Chapter 1 provides an introduction to the content and framework of the book. Chapter 2 deals with measures and variables, and introduces the concept of duality which is very important in this approach. In the last chapter of this part, the authors describe the different kinds of data which can be analyzed and the geometrical representation of the objects and variables defined in these data.

Part 2. Chapter 4 is devoted to linear regression presented from a geometrical point of view without any probabilistic references. Other regression methods and a short reference to canonical analysis and discriminant analysis end this chapter. The next two chapters are concerned with the decomposition of the inertia of a set of points. In the first chapter, this decomposition is defined using a partition of the set and at the end of this chapter, the authors describe second moment hierarchical clustering. It should be noted that this presentation is made without reference to other clustering methods and, for instance, the name of Ward is not cited. In the second chapter, this decomposition is defined using projection of the set of points on a subspace which gives rise to the definition of the principal axes.

Part 3. This last part includes chapters on principal component analysis, correspondence analysis and multiple correspondence analysis. Each chapter contains a description of the type of data suitable for the process and the kind of geometrical representation associated with these data. After a mathematical description of the method, a paragraph is devoted to the methodology and interpretation of the results and a comprehensive case-study ends the last chapter.

The bibliography is mainly devoted to the Benzécri school of data analysis.

¹ Analyse préalablement parue in *Journal of Classification* 13, (1996), pp. 173-174.

Overall, the organization and writing are good and the development in each chapter is careful and logical. But, since this book is intended to give lay readers some understanding of the theory of data analysis methods and enable them to interpret their results, I suspect that many readers will have difficulty with the mathematical-geometrical description provided by the authors. Nevertheless, even though the explanation of the theory might prove difficult for the reader, the numerous detailed examples should help him or her gain a clear insight into the methods described in this book.

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