



Methods of Multivariate Analysis

By Alvin C. Rencher, William F. Christensen

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Praise for the *Second Edition*

"This book is a systematic, well-written, well-organized text on multivariate analysis packed with intuition and insight . . . There is much practical wisdom in this book that is hard to find elsewhere."

—*IIE Transactions*

Filled with new and timely content, *Methods of Multivariate Analysis, Third Edition* provides examples and exercises based on more than sixty real data sets from a wide variety of scientific fields. It takes a "methods" approach to the subject, placing an emphasis on how students and practitioners can employ multivariate analysis in real-life situations.

This *Third Edition* continues to explore the key descriptive and inferential procedures that result from multivariate analysis. Following a brief overview of the topic, the book goes on to review the fundamentals of matrix algebra, sampling from multivariate populations, and the extension of common univariate statistical procedures (including *t*-tests, analysis of variance, and multiple regression) to analogous multivariate techniques that involve several dependent variables. The latter half of the book describes statistical tools that are uniquely multivariate in nature, including procedures for discriminating among groups, characterizing low-dimensional latent structure in high-dimensional data, identifying clusters in data, and graphically illustrating relationships in low-dimensional space. In addition, the authors explore a wealth of newly added topics, including:

- Confirmatory Factor Analysis
- Classification Trees
- Dynamic Graphics
- Transformations to Normality
- Prediction for Multivariate Multiple Regression
- Kronecker Products and Vec Notation

New exercises have been added throughout the book, allowing readers to test their comprehension of the presented material. Detailed appendices provide

partial solutions as well as supplemental tables, and an accompanying FTP site features the book's data sets and related SAS® code.

Requiring only a basic background in statistics, *Methods of Multivariate Analysis, Third Edition* is an excellent book for courses on multivariate analysis and applied statistics at the upper-undergraduate and graduate levels. The book also serves as a valuable reference for both statisticians and researchers across a wide variety of disciplines.

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Methods of Multivariate Analysis By Alvin C. Rencher, William F. Christensen Bibliography

- Sales Rank: #732783 in Books

- Brand: Brand: Wiley
- Published on: 2012-07-10
- Original language: English
- Number of items: 1
- Dimensions: 9.40" h x 1.90" w x 6.30" l, 2.65 pounds
- Binding: Hardcover
- 800 pages

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Editorial Review

Review

"...a systematic, well-written text...there is much practical wisdom in this book that is hard to find elsewhere. It belongs in serious data analysts' libraries..." (*IIE Transactions-Quality and Reliability Engineering*, November 2005)

"...extends univariate procedures...to analogous multivariate techniques involving several dependent variables..." (*SciTech Book News*, Vol. 26, No. 2, June 2002)

"...a practitioner who wants to carry out multivariate techniques in applied work and to interpret the results must have this book..." (*Technometrics*, Vol. 45, No. 1, February 2003)

"...I have not found a better text for a masters-level class in multivariate methods." (*Journal of the American Statistical Association*, March 2003)

"This book strikes a nice balance between meeting the needs of statistics majors and students in other fields. The discussion of each multivariate technique is straightforward and quite comprehensive. This textbook is likely to become a useful reference for students in their future work." (*Journal of the American Statistical Association*)

"In this well-written and interesting book, Rencher has done a great job in presenting intuitive and innovative explanations of some of the otherwise difficult concepts." (*CHOICE*)

"This book is excellent for an introductory course in multivariate analysis for students with minimal background in mathematics and statistics." (*Technometrics*)

"Excellent introduction to standard topics in multivariate analysis." (*American Mathematical Monthly*)

From the Publisher

A user-friendly text/reference providing excellent heuristic explanations of concepts and procedures. Features numerous examples from a wide variety of disciplines, scores of problems involving authentic data sets, abundant distribution tables and includes SAS command files for all text examples on an accompanying disk. Presents all major approaches to regression and demonstrates how they are related.

From the Back Cover

A primer on the analysis of multiple variables for students and scientists alike

"This book strikes a nice balance between meeting the needs of statistics majors and students in other fields. The discussion of each multivariate technique is straightforward and quite comprehensive. This textbook is likely to become a useful reference for students in their future work."

—*Journal of the American Statistical Association*

"In this well-written and interesting book, Rencher has done a great job in presenting intuitive and innovative explanations of some of the otherwise difficult concepts."

—*CHOICE*

"This book is excellent for an introductory course in multivariate analysis for students with minimal background in mathematics and statistics."

—*Technometrics*

"Excellent introduction to standard topics in multivariate analysis."

—*American Mathematical Monthly*

When measuring several variables on a complex experimental unit, it is often necessary to analyze the variables simultaneously, rather than isolate them and consider them individually. Multivariate analysis enables researchers to explore the joint performance of such variables and to determine the effect of each variable in the presence of the others. The Second Edition of Alvin Rencher's *Methods of Multivariate Analysis* provides students of all statistical backgrounds with both the fundamental and more sophisticated skills necessary to master the discipline.

To illustrate multivariate applications, the author provides examples and exercises based on fifty-nine real data sets from a wide variety of scientific fields. Rencher takes a "methods" approach to his subject, with an emphasis on how students and practitioners can employ multivariate analysis in real-life situations. The Second Edition contains revised and updated chapters from the critically acclaimed First Edition as well as brand-new chapters on:

- Cluster analysis
- Multidimensional scaling
- Correspondence analysis
- Biplots

Each chapter contains exercises, with corresponding answers and hints in the appendix, providing students the opportunity to test and extend their understanding of the subject. *Methods of Multivariate Analysis* provides an authoritative reference for statistics students as well as for practicing scientists and clinicians.

Amstat News asked three review editors to rate their top five favorite books in the September 2003 issue. *Methods of Multivariate Analysis* was among those chosen.

Users Review

From reader reviews:

David Pell:

As people who live in the modest era should be update about what going on or facts even knowledge to make these people keep up with the era that is always change and progress. Some of you maybe can update themselves by studying books. It is a good choice for you but the problems coming to you is you don't know what kind you should start with. This *Methods of Multivariate Analysis* is our recommendation to cause you to keep up with the world. Why, as this book serves what you want and wish in this era.

David Ochoa:

The e-book untitled *Methods of Multivariate Analysis* is the e-book that recommended to you you just read. You can see the quality of the publication content that will be shown to you. The language that article author use to explained their ideas are easily to understand. The author was did a lot of study when write the book,

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