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Statistical shape analysis. With applications in R. 2nd revised and updated edition. (English)

Zbl 1381.62003

Wiley Series in Probability and Statistics. Hoboken, NJ: John Wiley & Sons (ISBN 978-0-470-69962-1/hbk; 978-1-119-07249-2/ebook). xxiii, 454 p. (2016).

Publisher's description: Shape analysis is an important tool in the many disciplines where objects are compared using geometrical features. Examples include comparing brain shape in schizophrenia; investigating protein molecules in bioinformatics; and describing growth of organisms in biology.

This book is a significant update of the highly-regarded [Statistical shape analysis. Chichester: Wiley (1998; Zbl 0901.62072)] by the same authors. The new edition lays the foundations of landmark shape analysis, including geometrical concepts and statistical techniques, and extends to include analysis of curves, surfaces, images and other types of object data. Key definitions and concepts are discussed throughout, and the relative merits of different approaches are presented.

The authors have included substantial new material on recent statistical developments and offer numerous examples throughout the text. Concepts are introduced in an accessible manner, while retaining sufficient detail for more specialist statisticians to appreciate the challenges and opportunities of this new field. Computer code has been included for instructional use, along with exercises to enable readers to implement the applications themselves in R and to follow the key ideas by hands-on analysis.

The book will offer a valuable introduction to this fast-moving research area for statisticians and other applied scientists working in diverse areas, including archaeology, bioinformatics, biology, chemistry, computer science, medicine, morphometrics and image analysis

MSC:

- [62-02](#) Research exposition (monographs, survey articles) pertaining to statistics
- [62H11](#) Directional data; spatial statistics
- [62H25](#) Factor analysis and principal components; correspondence analysis
- [92-02](#) Research exposition (monographs, survey articles) pertaining to biology
- [68T10](#) Pattern recognition, speech recognition
- [62P10](#) Applications of statistics to biology and medical sciences; meta analysis

Cited in **54** Documents

Software:

[MorphoJ](#); [geomorph](#); [fastICA](#); [PAST](#); [shapes](#); [R](#); [AMBER](#)

Full Text: [DOI](#)