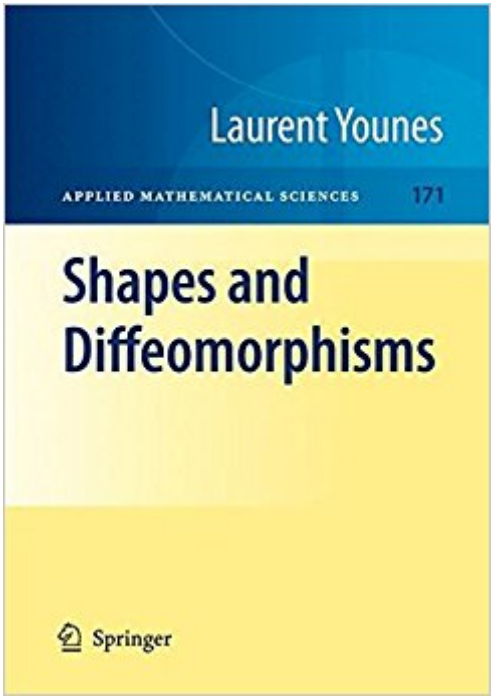
Shapes And Diffeomorphisms (Applied Mathematical Sciences, Vol. 171)



Synopsis

Shapes are complex objects to apprehend, as mathematical entities, in terms that also are suitable for computerized analysis and interpretation. This volume provides the background that is required for this purpose, including different approaches that can be used to model shapes, and algorithms that are available to analyze them. It explores, in particular, the interesting connections between shapes and the objects that naturally act on them, diffeomorphisms. The book is, as far as possible, self-contained, with an appendix that describes a series of classical topics in mathematics (Hilbert spaces, differential equations, Riemannian manifolds) and sections that represent the state of the art in the analysis of shapes and their deformations. A direct application of what is presented in the book is a branch of the computerized analysis of medical images, called computational anatomy.

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Customer Reviews

From the reviews:Ã¢â ¬Å“The book under review deals with the fascinating subject of shapes. Ã¢â ¬Â¦ This is a book on applied mathematics which provides a description of the wide range of methods that have been invented to represent, detect, or compare shapes Ã¢â ¬Â¦ together with the necessary mathematical background that they require. The book could also be of interest to an engineering- or computer-science-oriented reader, as it gives in several places concrete algorithms and applicable methods, including experimental illustrations.Ã¢â ¬Â• (Luca Granieri, Mathematical Reviews, Issue 2011 h)Ã¢â ¬Å“This book is an attempt at providing a description of a large range of methods used to represent, detect and compare shapes Ã¢â ¬Â¦ together with the mathematical

background that they require. Ã¢â ¬Â¦ This book on applied mathematics is of interest to engineers and computer scientists having direct applications in the computerized analysis of medical images. This theory will as well lead to other interesting applications in the future.Ã¢â ¬Â• (Corina Mohorianu, Zentralblatt MATH, Vol. 1205, 2011)

Shapes are complex objects, which are difficult to apprehend as mathematical entities, in ways that can also be amenable to computerized analysis and interpretation. This volume provides the background that is required for this purpose, including different approaches that can be used to model shapes, and algorithms that are available to analyze them. It explores, in particular, the interesting connections between shapes and the objects that naturally act on them, diffeomorphisms. The book is, as far as possible, self-contained, with an appendix that describes a series of classical topics in mathematics (Hilbert spaces, differential equations, Riemannian manifolds) and sections that represent the state of the art in the analysis of shapes and their deformations. A direct application of what is presented in the book is a branch of the computerized analysis of medical images, called computational anatomy.

This is a must have book for those who need to have a solid mathematical foundation for large deformation shape analysis.

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