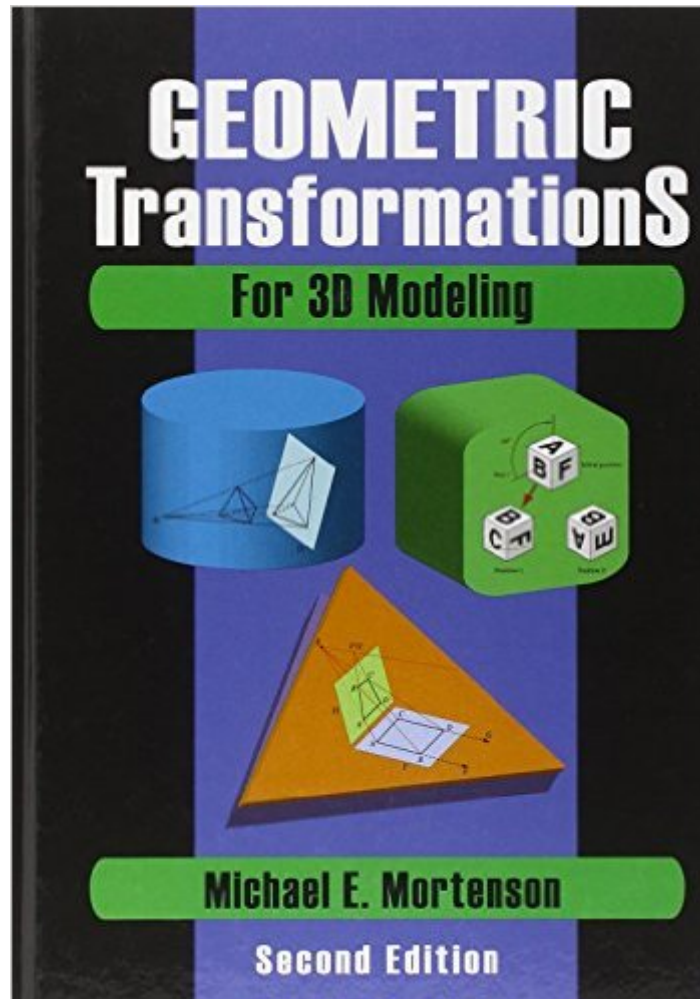# Geometric Transformations For 3D Modeling

Synopsis

Written from a mathematical standpoint accessible to students, teachers, and professionals studying or practicing in engineering, mathematics, or physics, the new second edition is a comprehensive introduction to the theory and application of transformations. Presenting the more abstract foundation material in the first three chapters, Geometric Transformations in 3D Modeling reduces the clutter of theoretical derivation and development in the remainder of the text and introduces the operational and more application-oriented tools and concepts as the need arises. It assumes the reader has already taken analytic geometry and first-year calculus and has a working knowledge of basic matrix and vector algebra. This self-contained resource is sure to appeal to those working in 3D modeling, geometric modeling, computer graphics, animation, robotics, and kinematics.Explores and develops the subject in much greater breadth and depth than other books, offering readers a better understanding of transformation theory, the role of invariants, the uses of various notation systems, and the relations between transformations.Describes how geometric objects may change position, orientation, or even shape when subjected to mathematical operations, while properties characterizing their geometric identity and integrity remain unchanged.Presents eigenvalues, eigenvectors, and tensors in a way that makes it easier for readers to understand.Contains revised and improved figures, with many in color to highlight important features.Provides exercises throughout nearly all of the chapters whose answers are found at the end of the book.

Book Information

Hardcover: 380 pages

Publisher: Industrial Press, Inc.; 2 edition (April 1, 2007)

Language: English

ISBN-10: 0831133384

ISBN-13: 978-0831133382

Product Dimensions: 7.3 x 1.1 x 10 inches

Shipping Weight: 2 pounds (View shipping rates and policies)

Average Customer Review: 4.5 out of 5 stars See all reviews (2 customer reviews)

Best Sellers Rank: #2,654,751 in Books (See Top 100 in Books)   #82 in Books > Science & Math > Mathematics > Transformations   #549 in Books > Computers & Technology > Graphics & Design > 3D Graphics   #964 in Books > Computers & Technology > Databases & Big Data > Data Modeling & Design

Customer Reviews

Excellent Book! Quite readable, and gives historical and practical insights into the mathematics being presented. I am a retired engineer, so I do have some math in my background, and I found the level just right.

Pedagogically, Mortenson's presentation is easy for a reader to follow. Accompanied by generous numbers of diagrams. He gives understandable interpretations of how matrices are used to represent different types of transformations. The underlying geometrical rationale is clear.En route, the reader is gently introduced to group theory. For finite groups. A way to bind geometry and symmetry. Interestingly, the notation he uses for the symmetries and groups is Schonflies. In 1982, this was already being phased out by crystallographers, in favour of International notation. But maybe mathematicians prefer the older style.There is also a quick discussion of tensors. Giving rise to contra and covariant vectors. And the metric tensor is introduced as a key idea. All this is a jumping off point for physicists studying General Relativity, though it is not actually mentioned by name.

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