Modeling of Curves and Surfaces with MATLAB [

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Monografía

This text on geometry is devoted to various central geometrical topics including: graphs of functions, transformations, (non-)Euclidean geometries, curves and surfaces as well as their applications in a variety of disciplines. This book presents elementary methods for analytical modeling and demonstrates the potential for symbolic computational tools to support the development of analytical solutions. The author systematically examines several powerful tools of MATLAB including 2D and 3D animation of geometric images with shadows and colors, transformations using matrices, and then studies more complex geometrical modeling problems related to analysis of curves and surfaces. With over 150 stimulating exercises and problems, this text integrates traditional differential and non-Euclidean geometries with more current computer systems in a practical and user-friendly format. This text greatly extends the author's previous title, Geometry of Curves and Surfaces with Maple (Birkhuser, 2000), and has a different focus. In addition to being applications driven and motivated by numerous examples and exercises from real-world fields, the book also contains over 60 percent new material, including new sections with complex numbers, quaternions, matrices and transformations, hyperbolic geometry, fractals, and surface-splines and over 300 figures reproducible using MATLAB programs. This text is an excellent classroom resource or self-study reference for undergraduate students in a variety of disciplines, engineers, computer scientists, and instructors of applied mathematics

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