Computational Geometry: Lectures at the Morningside Center of Mathematics

Table of Contents

1. R.-H. Wang ~ On computational geometry
2. B. A. Barsky ~ Geometry for analysis of corneal shape
3. C. Falai ~ Approximate implicitization of rational surfaces
4. H. Du ~ A geometric approach to $\dim S_2^1(\Delta _{MS})$
5. N. Dyn, S. Hed, and D. Levin ~ Subdivision for C^1 surface interpolation
6. G. Farin and D. Hansford ~ A permanence principle for shape control
7. G. Feng, T. Wu, K. Yu, S. Zhang, and Y. Zhou ~ Blending several implicit algebraic surfaces with ruled surfaces
8. G. Nürnberger and F. Zeilfelder ~ Lagrange interpolation by splines on triangulations
9. E. Binz and W. Schempp ~ Quantum teleportation and spin echo: A unitary symplectic spinor ap- proach
10. X. Shi and R.-H. Wang ~ The generalization of Pascal's theorem and Morgan-Scott's partition
11. C. R. Traas ~ `Optimal' triangulation of surfaces and bodies
12. R.-H. Wang ~ Multivariate spline and geometry
13. Z. Wu ~ Geometric continuous B-spline–A generalization of the approach of γ-spline
14. G. Xu ~ Adaptive and smooth surface construction by triangular A-patches
15. G. Zhao and R.-H. Wang ~ A B-spline function in $s_3^1(R^3,\Delta_2^*)$

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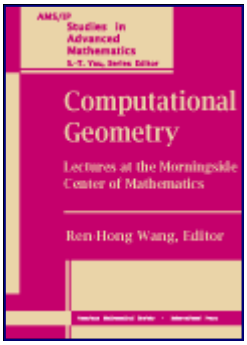

Description

Computational geometry is a borderline subject related to pure and applied mathematics, computer science, and engineering. The book contains articles on various topics in computational geometry based on invited lectures and contributed papers presented during the program on computational geometry at the Morningside Center of Mathematics at the Chinese Academy of Sciences (Beijing).

The opening article by R.-H. Wang gives a nice survey of various aspects of computational geometry, many of which are discussed in detail in the volume. Topics of the other articles include problems of optimal triangulation, splines, data interpolation, problems of curve and surface design, problems of shape control, quantum teleportation, and more.

The book is suitable for graduate students and researchers interested in computational geometry and specialists in theoretical computer science.

Higher Franz-Reidemeister Torsion

Author: Kiyoshi Igusa

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Table of Contents:

1. Cocycles in Volodin K-theory
2. Spaces of matrices and higher Franz-Reidemeister torsion
3. A model for the Whitehead spaces
4. Morse theory and filtered chain complexes
5. Homotopy type of the Whitehead space
6. The framing principle and Bökstedt's theorem
7. Proof of complexified Bökstedt theorem
8. Framed graphs
9. Bibliography
10. Index

Description

The book is devoted to the theory of topological higher Franz-Reidemeister torsion in K-theory. The author defines the higher Franz-Reidemeister torsion based on Volodin's K-theory and Borel's regulator map. He describes its properties and generalizations and studies the relation between the higher Franz-Reidemeister torsion and other torsions used in K-theory: Whitehead torsion and Ray-Singer torsion. He also presents methods of computing higher Franz-Reidemeister torsion, illustrates them with numerous examples, and describes various applications of higher Franz-Reidemeister torsion, particularly for the study of homology of mapping class groups. Packed with up-to-date information, the book provides a unique research and reference tool for specialists working in algebraic topology and K-theory.