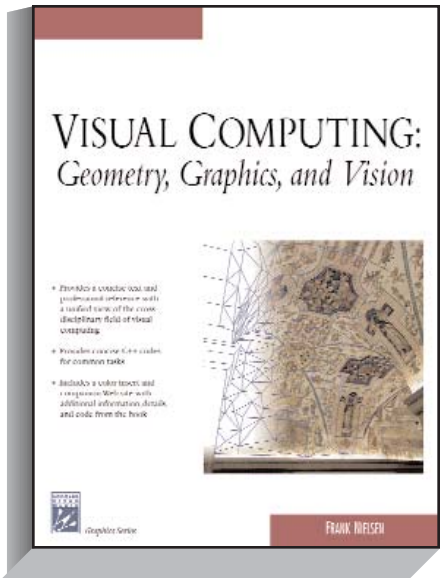
# New Title Information

## Visual Computing:

## Geomery, Graphics, and Vision

***Frank Nielsen***




*Visual Computing: Geometry, Graphics, and Vision* is a concise introduction to common notions, methodologies, data structures and algorithmic techniques arising in the mature fields of computer graphics, computer vision, and computational geometry. The central goal of the book is to provide a global and unified view of the rich interdisciplinary visual computing field that encompasses traditional computer graphics, computer vision, and computational geometry. The book is targeted at undergraduate students, and gaming or graphics professionals. Lecturers in computer graphics/vision may find this textbook complementary and valuable. The book aims at broadening and fostering readers' knowledge of essential 3D techniques by providing a sizeable overall picture and describing essential concepts. Throughout the book, appropriate real world applications are covered to illustrate the use and generate an interest in adjacent fields. The book also provides concise C++ codes for common tasks that should be compelling to a broad audience of practitioners.

**ISBN: .....1-58450-427-7**

**PRICE:.....$59.95**

**PUB DATE:.....June 2005**

**SPECS:.....Hardcover**

**TRIM SIZE: .....7.38 x 9.25**

**PAGES: .....~500pp**

### Key Features:

- Provides a concise text and professional reference on the cross-disciplinary field of visual computing
- Complements traditional textbooks in computer graphics/geometry/vision
- Includes a color insert to illustrate principles
- Unifies the core "3D" concepts
- Provides concise C++ codes for common tasks that should be compelling to broad audience of practitioners
- Includes a companion Web site with additional information, details, and code from the book

### Brief TOC:

**Chapter 1: Introduction:** 1.1 What Is Visual Computing?; 1.2 Target Audience; 1.3 Organization of the Book; 1.4 Future of Visual Computing; 1.5 Companion Web Site; **Chapter 2: Abstract Data Structures:** 2.1 Pointers, Arrays, Lists, and Graphs; 2.2 Stacks and Queues; 2.3 Dictionaries; 2.4 Priority Queues; 2.5 Disjoint Sets; 2.6 Geometric Hashing; 2.7 C++ Templates, Standard Template Library, and Traits Classes; 2.8 Bibliographical Notes; **Chapter 3: Coordinate Pipelines:** 3.1 Transformation Principles; 3.2 Geometry Pipeline; 3.3 Graphics Pipeline; 3.4 Vision Pipelines; 3.5 Advanced Pipelines; 3.6 Summary and Perspectives; 3.7 Bibliographical Notes; **Chapter 4: Images:** 4.1 Application: Warping and Morphing Images; 4.2 Interpolations; 4.3 Colors; 4.4 Halftoning and Dithering; 4.5 High Dynamic Range Imaging; 4.6 Image Pyramids; 4.7 Bibliographical Notes; **Chapter 5: Meshes:** 5.1 Prelude to Meshes; 5.2 Basic Mesh Descriptions; 5.3 Data Structures for Meshes; 5.4 Operations on Meshes; 5.5 Geometry Images; 5.6 Alternative to Meshes; 5.7 Bibliographical Notes; **Chapter 6: Animation:** 6.1 Kinetic Data Structures; 6.2 Motion Capture; 6.3 Computer Graphics Animation; 6.4 Bibliographical Notes; **Chapter 7: Randomization:** 7.1 Randomized Analysis of QuickSort; 7.2 Random Sample Consensus; 7.3 Monte-Carlo Samplings; 7.4 Randomizing Incremental Algorithms; 7.5 Randomized Incremental Optimization; 7.6 Skip Lists; 7.7 Bibliographical notes; **Chapter 8: Higher Dimensions for "3D":** 8.1 Nearest Neighbours; 8.2 Clustering; 8.3 Mathematical Techniques; 8.4 Bibliographical Notes; **Chapter 9: Robustness:** 9.1 Identifying Weaknesses and Defining Robustness; 9.2 IEEE 754 Floating Point; 9.3 Filtering Predicates; 9.4 Predicate degrees; 9.5 Overview of Libraries; 9.6 Bibliographical Notes

### Market Overview

**Audience:** Undergraduate/Graduate students in computer graphics and programming, gaming or graphics professionals and researchers
**Market:** Computer graphics, computational geometry

### Author Bio

**Frank Nielsen** (Japan) who is a technical director and researcher at Sony Computer Science Laboratories, has written extensively on graphic design and programming in several journals including, Transactions on Graphics and International Journal of Image and Graphics. His writings have also appeared in numerous conference papers such as Volumetric Illustration: Designing 3D Models with Internal Textures at SIGGRAPH and Small(est) Enclosing Balls in Unbounded Dimension at Japan Conference on Discrete & Computational Geometry. Nielsen has also taught in France at ESSI and ISIA, Ecole des Mines de Paris.

### Market Spotters

Akenine-Moller T, Haines E, *Real-Time Rendering,* AK Peters Ltd., 880pp, $60.00, 2002, 1568811829
Watt, A H, *3D Computer Graphics, Third Edition,* Addison-Wesley, 570pp, $60.00, 1999, 0201398559
De Berg M, van Kreveld M, Overmars M, Schwarzkopf O, *Computational Geometry,* Springer, 370pp, $50.00, 1997, 3540656200
Lander, Jeff, *Graphics Programming Methods,* Charles River Media; 406pp; $49.95; 2003, 1584502991