
Contents

Part I Surface Extraction Methods from Medical Imaging Data

Towards Automatic Generation of 3D Models of Biological Objects Based on Serial Sections

Vincent Jasper Dercksen, Cornelia Brüß, Detlev Stalling, Sabine Gubatz, Udo Seiffert, and Hans-Christian Hege 3

A Topological Approach to Quantitation of Rheumatoid Arthritis

Hamish Carr, John Ryan, Maria Joyce, Oliver Fitzgerald, Douglas Veale, Robin Gibney, and Patrick Brennan 27

3D Visualization of Vasculature: An Overview

Bernhard Preim and Steffen Oeltze 39

3D Surface Reconstruction from Endoscopic Videos

Arie Kaufman and Jianning Wang 61

Part II Geometry Processing in Medical Applications

A Framework for the Visualization of Cross Sectional Data in Biomedical Research

Enrico Kienel, Marek Vančo, Guido Brunneth, Thomas Kowalski, Roland Clauß, and Wolfgang Knabe 77

Towards a Virtual Echocardiographic Tutoring System

Gerd Reis, Bernd Lappé, Sascha Köhn, Christopher Weber, Martin Bertram, and Hans Hagen 99

Supporting Depth and Motion Perception in Medical Volume Data

Jennis Meyer-Spradow, Timo Ropinski, and Klaus Hinrichs 121

Part III Visualization of Multi-channel Medical Imaging Data

Multimodal Image Registration for Efficient Multi-resolution Visualization
Joerg Meyer 137

A User-friendly Tool for Semi-automated Segmentation and Surface Extraction from Color Volume Data Using Geometric Feature-space Operations
Tetyana Ivanovska and Lars Linsen 153

Part IV Vector and Tensor Visualization in Medical Applications

Global Illumination of White Matter Fibers from DT-MRI Data
David C. Banks and Carl-Fredrik Westin 173

Direct Glyph-based Visualization of Diffusion MR Data Using Deformed Spheres
Martin Domin, Sönke Langner, Norbert Hosten, and Lars Linsen 185

Visual Analysis of Bioelectric Fields
Xavier Tricoche, Rob MacLeod, and Chris R. Johnson 205

MRI-based Visualisation of Orbital Fat Deformation During Eye Motion
Charl P. Botha, Thijs de Graaf, Sander Schutte, Ronald Root, Piotr Wielopolski, Frans C.T. van der Helm, Huibert J. Simonsz, and Frits H. Post 221

Part V Visualizing Molecular Structures

Visual Analysis of Biomolecular Surfaces
Vijay Natarajan, Patrice Koehl, Yusu Wang, and Bernd Hamann 237

BioBrowser – Visualization of and Access to Macro-Molecular Structures
Lars Offen and Dieter Fellner 257

Visualization of Barrier Tree Sequences Revisited
Christian Heine, Gerik Scheuermann, Christoph Flamm, Ivo L. Hofacker, and Peter F. Stadler 275

Part VI Visualizing Gene Expression Data

Interactive Visualization of Gene Regulatory Networks with Associated Gene Expression Time Series Data	
<i>Michel A. Westenberg, Sacha A. F. T. van Hijum, Andrzej T. Lulko, Oscar P. Kuipers, and Jos B. T. M. Roerdink</i>	293
Segmenting Gene Expression Patterns of Early-stage Drosophila Embryos	
<i>Min-Yu Huang, Oliver Rübel, Gunther H. Weber, Cris L. Luengo Hendriks, Mark D. Biggin, Hans Hagen, and Bernd Hamann</i>	313
Color Plates	329