

Table of Contents

Theory

Similarity between Hypergraphs Based on Mathematical Morphology . . . <i>Isabelle Bloch, Alain Bretto, and Aurélie Leborgne</i>	1
Simplification Operators on a Dimension-Independent Graph-Based Representation of Morse Complexes <i>Lidija Čomić, Leila De Floriani, and Federico Iuricich</i>	13
Random Tessellations and Boolean Random Functions <i>Dominique Jeulin</i>	25
Discrete Set-Valued Continuity and Interpolation <i>Laurent Najman and Thierry Géraud</i>	37
Solving Problems in Mathematical Morphology through Reductions to the U-Curve Problem <i>Marcelo S. Reis and Junior Barrera</i>	49
Analytical Solutions for the Minkowski Addition Equation <i>Joel Edu Sánchez Castro, Ronaldo Fumio Hashimoto, and Junior Barrera</i>	61

Trees and Hierarchies

A Comparison of Many Max-tree Computation Algorithms <i>Edwin Carlinet and Thierry Géraud</i>	73
Constructive Links between Some Morphological Hierarchies on Edge-Weighted Graphs <i>Jean Cousty, Laurent Najman, and Benjamin Perret</i>	86
A Quasi-linear Algorithm to Compute the Tree of Shapes of nD Images <i>Thierry Géraud, Edwin Carlinet, Sébastien Crozet, and Laurent Najman</i>	98
Efficient Schemes for Computing α -Tree Representations <i>Jiří Havel, François Merciol, and Sébastien Lefèvre</i>	111
Ground Truth Energies for Hierarchies of Segmentations <i>Bangalore Ravi Kiran and Jean Serra</i>	123

Playing with Kruskal: Algorithms for Morphological Trees in Edge-Weighted Graphs	135
<i>Laurent Najman, Jean Cousty, and Benjamin Perret</i>	
Optima on Hierarchies of Partitions	147
<i>Jean Serra and Bangalore Ravi Kiran</i>	
Semi-connections and Hierarchies	159
<i>Olena Tankyevych, Hugues Talbot, and Nicolas Passat</i>	
Adaptive Morphology	
Stochastic Morphological Filtering and Bellman-Maslov Chains	171
<i>Jesús Angulo and Santiago Velasco-Forero</i>	
Salience-Based Parabolic Structuring Functions	183
<i>Vladimir Ćurić and Cris L. Luengo Hendriks</i>	
Adaptive Morphologic Regularizations for Inverse Problems	195
<i>Pulak Purkait and Bhabatosh Chanda</i>	
Attribute Controlled Reconstruction and Adaptive Mathematical Morphology	207
<i>Andrés Serna and Beatriz Marcotegui</i>	
On Nonlocal Mathematical Morphology	219
<i>Santiago Velasco-Forero and Jesús Angulo</i>	
Colour	
Vectorial Quasi-flat Zones for Color Image Simplification	231
<i>Erhan Aptoula, Jonathan Weber, and Sébastien Lefèvre</i>	
Morphology for Color Images via Loewner Order for Matrix Fields	243
<i>Bernhard Burgeth and Andreas Kleefeld</i>	
A Multivariate Mathematical Morphology Based on Orthogonal Transformation, Probabilistic Extrema Estimation and Distance Optimization	255
<i>Alexandru Căliman, Mihai Ivanovici, Noël Richard, and Gheorghe Toacșe</i>	
Group-Invariant Frames for Colour Morphology	267
<i>Jasper J. van de Gronde and Jos B.T.M. Roerdink</i>	

Manifolds and Metrics

Mathematical Morphology for Real-Valued Images on Riemannian Manifolds	279
<i>Jesús Angulo and Santiago Velasco-Forero</i>	
A Weight Sequence Distance Function	292
<i>Benedek Nagy, Robin Strand, and Nicolas Normand</i>	
The Laplace-Beltrami Operator: A Ubiquitous Tool for Image and Shape Processing	302
<i>Aaron Wetzler, Yonathan Aflalo, Anastasia Dubrovina, and Ron Kimmel</i>	

Filtering

Towards Morphological Image Regularization Using the Counter-Harmonic Mean	317
<i>Jorge Larrey-Ruiz, Rafael Verdú-Monedero, Juan Morales-Sánchez, and Jesús Angulo</i>	
A Learning Framework for Morphological Operators Using Counter-Harmonic Mean	329
<i>Jonathan Masci, Jesús Angulo, and Jürgen Schmidhuber</i>	
Flooding Edge or Node Weighted Graphs	341
<i>Fernand Meyer</i>	
Towards Connected Filtering Based on Component-Graphs	353
<i>Benoît Naegel and Nicolas Passat</i>	
Inf-structuring Functions and Self-dual Marked Flattenings in bi-Heyting Algebra	365
<i>Benjamin Perret</i>	
From Extrema Relationships to Image Simplification Using Non-flat Structuring Functions	377
<i>Guilherme Polo and Neucimar J. Leite</i>	
Two Applications of Shape-Based Morphology: Blood Vessels Segmentation and a Generalization of Constrained Connectivity	390
<i>Yongchao Xu, Thierry Géraud, and Laurent Najman</i>	

Detectors and Descriptors

Robust Keypoint Detection Using Dynamics	402
<i>Miguel Angel Cataño and Juan Climent</i>	

A Granulometry Based Descriptor for Object Categorization 413
Arnaldo Câmara Lara and Roberto Hirata Jr.

Qualitative Comparison of Contraction-Based Curve Skeletonization
Methods 425
*André Sobiecki, Haluk C. Yasan, Andrei C. Jalba, and
Alexandru C. Telea*

Detection of Texture and Isolated Features Using Alternating
Morphological Filters 440
Igor Zingman, Dietmar Saupe, and Karsten Lambers

Applications

Estimation of Separating Planes between Touching 3D Objects Using
Power Watershed 452
Clara Jaquet, Edward Andò, Gioacchino Viggiani, and Hugues Talbot

Efficient 1D and 2D Barcode Detection Using Mathematical
Morphology 464
Melinda Katona and László G. Nyúl

Faster Fuzzy Connectedness via Precomputation 476
Filip Malmberg and Robin Strand

Mask Connectivity by Viscous Closings: Linking Merging Galaxies
without Merging Double Stars 484
Ugo Moschini, Scott C. Trager, and Michael H.F. Wilkinson

Discrete Simulation of a Chladni Experiment 496
Frédéric Rieux

Automated Quality Inspection of Microfluidic Chips Using Morphologic
Techniques 508
*Thomas Schwarzbauer, Martin Welk, Chris Mayrhofer, and
Rainer Schubert*

Geography, Mathematics and Mathematical Morphology 520
Christine Voiron-Canicio

Author Index 531