

Table of Contents

Invited Paper

Digital Circularity and Its Applications	1
<i>Partha Bhowmick, Sahadev Bera, and Bhargab B. Bhattacharya</i>	

Digital Geometry - Curves, Straightness, and Convexity

On the Convex Hull of the Integer Points in a Bi-circular Region	16
<i>Valentin E. Brimkov</i>	
Multi-primitive Analysis of Digital Curves	30
<i>Alexandre Faure and Fabien Feschet</i>	
What Does Digital Straightness Tell about Digital Convexity?	43
<i>Tristan Roussillon, Laure Tougne, and Isabelle Sivignon</i>	

Digital Geometry - Geometric Transformations, Metrics, Distance Transforms, and Skeletons

Hierarchical Discrete Medial Axis for Sphere-Tree Construction	56
<i>Alain Broutta, David Coeurjolly, and Isabelle Sivignon</i>	
Quasi-Affine Transformation in 3-D: Theory and Algorithms	68
<i>David Coeurjolly, Valentin Blot, and Marie-Andrée Jacob-Da Col</i>	
Farey Sequences and the Planar Euclidean Medial Axis Test Mask	82
<i>Jérôme Hulin and Édouard Thiel</i>	
Neighborhood Sequences on n D Hexagonal/Face-Centered-Cubic Grids	96
<i>Benedek Nagy and Robin Strand</i>	
Neighborhood Sequences in the Diamond Grid – Algorithms with Four Neighbors	109
<i>Benedek Nagy and Robin Strand</i>	
Hinge Angles for 3D Discrete Rotations	122
<i>Yohan Thibault, Akihiro Sugimoto, and Yukiko Kenmochi</i>	

Segmentation, Thinning and Skeletonization

Surface Thinning in 3D Cubical Complexes	135
<i>John Chaussard and Michel Couprie</i>	
A General Bayesian Markov Random Field Model for Probabilistic Image Segmentation	149
<i>Oscar Dalmau and Mariano Rivera</i>	
An Order-Independent Sequential Thinning Algorithm	162
<i>Péter Kardos, Gábor Németh, and Kálmán Palágyi</i>	
Blurred Segments in Gray Level Images for Interactive Line Extraction	176
<i>Bertrand Kerautret and Philippe Even</i>	
Multi-scale Analysis of Discrete Contours for Unsupervised Noise Detection	187
<i>Bertrand Kerautret and Jacques-Olivier Lachaud</i>	
Sub-pixel Segmentation with the Image Foresting Transform	201
<i>Filip Malmberg, Joakim Lindblad, and Ingela Nyström</i>	

Image Representation, Processing, Analysis, Reconstruction and Recognition - Algorithms and Applications

Phase-Correlation Guided Search for Realtime Stereo Vision	212
<i>Alfonso Alba and Edgar Arce-Santana</i>	
PCIF: An Algorithm for Lossless True Color Image Compression	224
<i>Elena Barucci, Srećko Brlek, and Stefano Brocchi</i>	
Ego-Vehicle Corridors for Vision-Based Driver Assistance	238
<i>Ruyi Jiang, Reinhard Klette, Tobi Vaudrey, and Shigang Wang</i>	
Adaptive Pixel Resizing for Multiscale Recognition and Reconstruction	252
<i>Marc Rodríguez, Gaëlle Largeteau-Skapin, and Eric Andres</i>	
Contour Reconstruction for Multiple 2D Regions Based on Adaptive Boundary Samples	266
<i>Peer Stelldinger and Leonid Tcherniavski</i>	

Digital Tomography

Reconstruction of Canonical $h\nu$ -Convex Discrete Sets from Horizontal and Vertical Projections	280
<i>Péter Balázs</i>	

About the Complexity of Timetables and 3-Dimensional Discrete Tomography: A Short Proof of NP-Hardness	289
<i>Yan Gerard</i>	

Image Models Based on Geometry, Combinatorics, Arithmetics, Algebra, Mathematical Morphology, Topology and Grammars

Theoretical Issues of Cluster Pattern Interfaces	302
<i>Reneta P. Barneva, Valentin E. Brimkov, and Kamen K. Kanev</i>	
Ω -Arithmetization: A Discrete Multi-resolution Representation of Real Functions	316
<i>Agathe Chollet, Guy Wallet, Laurent Fuchs, Eric Andres, and Gaëlle Largeteau-Skapin</i>	
Tree-Based Encoding for Cancellations on Morse Complexes	330
<i>Lidija Čomić and Leila De Floriani</i>	
Parallel Contextual Hexagonal Array Grammars and Languages	344
<i>D.G. Thomas, M.H. Begam, and N.G. David</i>	
Connected Viscous Filters	358
<i>Ana M. Herrera-Navarro, Israel Santillán, Jorge D. Mendiola-Santibáñez, and Iván R. Terol-Villalobos</i>	
Signatures of Combinatorial Maps	370
<i>Stéphane Gosselin, Guillaume Damiand, and Christine Solnon</i>	

Digital Topology and its Applications to Image Modeling and Analysis

Using Membrane Computing for Obtaining Homology Groups of Binary 2D Digital Images	383
<i>Hepzibah A. Christinal, Daniel Díaz-Pernil, and Pedro Real Jurado</i>	
Collapses and Watersheds in Pseudomanifolds	397
<i>Jean Cousty, Gilles Bertrand, Michel Couprie, and Laurent Najman</i>	
The Inscribed Square Conjecture in the Digital Plane	411
<i>Feliú Sagols and Raúl Marín</i>	
Convenient Closure Operators on $\mathbb{Z}^2$	425
<i>Josef Šlapal</i>	
Author Index	437