

Table of Contents

Models for Discrete Geometry

Optimal Covering of a Straight Line Applied to Discrete Convexity	1
<i>Jean-Marc Chassery and Isabelle Sivignon</i>	
On Dimension Partitions in Discrete Metric Spaces	11
<i>Fabien Rebatel and Édouard Thiel</i>	
Walking in the Farey Fan to Compute the Characteristics of a Discrete Straight Line Subsegment	23
<i>Isabelle Sivignon</i>	
Persistent Patterns in Integer Discrete Circles	35
<i>André Hoarau and Thierry Monteil</i>	
Comparison of Point Clouds Acquired by 3D Scanner	47
<i>Natalia Dyshkant</i>	
Generalized Simple Surface Points	59
<i>J.C. Ciria, E. Domínguez, A.R. Francés, and A. Quintero</i>	

Discrete and Combinatorial Topology

A Parallel Thinning Algorithm for Grayscale Images	71
<i>Michel Couprie, Nivando Bezerra, and Gilles Bertrand</i>	
New Structures Based on Completions	83
<i>Gilles Bertrand</i>	
Asymptotic Analysis and Random Sampling of Digitally Convex Polyominoes	95
<i>O. Bodini, Ph. Duchon, A. Jacquot, and L. Mutafchiev</i>	
Critical Connectedness of Thin Arithmetical Discrete Planes	107
<i>Valérie Berthé, Damien Jamet, Timo Jolivet, and Xavier Provençal</i>	
A 3D Curvilinear Skeletonization Algorithm with Application to Path Tracing	119
<i>John Chaussard, Laurent Noël, Venceslas Biri, and Michel Couprie</i>	

Geometric Transforms

From the Zones of Influence of Skeleton Branch Points to Meaningful Object Parts	131
<i>L. Serino, C. Arcelli, and G. Sanniti di Baja</i>	
Merging Faces: A New Orthogonal Simplification of Solid Models	143
<i>Irving Cruz-Matías and Dolors Ayala</i>	
Sufficient Conditions for Topological Invariance of 2D Images under Rigid Transformations	155
<i>Phuc Ngo, Yukiko Kenmochi, Nicolas Passat, and Hugues Talbot</i>	
Digital Distances and Integer Sequences	169
<i>Nicolas Normand, Robin Strand, and Pierre Evenou</i>	

Discrete Shape Representation, Recognition and Analysis

The Persistence Space in Multidimensional Persistent Homology	180
<i>Andrea Cerri and Claudia Landi</i>	
A Study of Monodromy in the Computation of Multidimensional Persistence	192
<i>Andrea Cerri, Marc Ethier, and Patrizio Frosini</i>	
Skeleton Extraction of Vertex Sets Lying on Arbitrary Triangulated 3D Meshes	203
<i>Dimitri Kudelski, Sophie Viseur, and Jean-Luc Mari</i>	
Integral Based Curvature Estimators in Digital Geometry	215
<i>David Coeurjolly, Jacques-Olivier Lachaud, and Jérémy Levallois</i>	
A Fast Algorithm for Liver Surgery Planning	228
<i>Fajie Li, Xinbo Fu, Gisela Klette, and Reinhard Klette</i>	
$O(n^3 \log n)$ Time Complexity for the Optimal Consensus Set Computation for 4-Connected Digital Circles	241
<i>Gaelle Largeteau-Skapin, Rita Zour, and Eric Andres</i>	
Efficient Robust Digital Annulus Fitting with Bounded Error	253
<i>Minh Son Phan, Yukiko Kenmochi, Akihiro Sugimoto, Hugues Talbot, Eric Andres, and Rita Zour</i>	
Arc Recognition on Irregular Isothetic Grids and Its Application to Reconstruction of Noisy Digital Contours	265
<i>Jean-Luc Toutant, Antoine Vacavant, and Bertrand Kerautret</i>	

Morphological Analysis and Discrete Tomography

Reconstruction of Quantitative Properties from X-Rays	277
<i>Fatma Abdmouleh and Mohamed Tajine</i>	
On the Non-additive Sets of Uniqueness in a Finite Grid	288
<i>Sara Brunetti, Paolo Dulio, and Carla Peri</i>	
On the Degree Sequences of Uniform Hypergraphs	300
<i>Andrea Frosini, Christophe Picouleau, and Simone Rinaldi</i>	
How to Decompose a Binary Matrix into three $h\nu$ -convex Polyominoes	311
<i>Andrea Frosini and Christophe Picouleau</i>	
Multi-resolution Cell Complexes Based on Homology-Preserving Euler Operators	323
<i>Lidija Čomić, Leila De Floriani, and Federico Iuricich</i>	

Discrete and Combinatorial Tools for Image Segmentation and Analysis

Convergence of Level-Wise Convolution Differential Estimators	335
<i>Damien Gonzalez, Rémy Malgouyres, Henri-Alex Esbelin, and Chafik Samir</i>	
Concurrency Relations between Digital Planes	347
<i>Peter Veelaert, Maarten Slembrouck, and Dirk Van Haerenborgh</i>	
Scale Filtered Euclidean Medial Axis	360
<i>Michał Postolski, Michel Couprie, and Marcin Janaszewski</i>	
A Method for Feature Detection in Binary Tomography	372
<i>Wagner Fortes and K. Joost Batenburg</i>	
Knot Segmentation in Noisy 3D Images of Wood	383
<i>A. Krähenbühl, Bertrand Kerautret, and I. Debled-Rennesson</i>	
Multigrid Convergent Curvature Estimator	395
<i>Christophe Fiorio, Christian Mercat, and Frédéric Rieux</i>	
Author Index	407