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Applications of Discrete Geometry and Mathematical Morphology

First International Workshop, WADGMM 2010
Istanbul, Turkey, August 22, 2010
Revised Selected Papers

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Preface

Discrete geometry and mathematical morphology play essential roles in image analysis, computer graphics, pattern recognition, shape modeling, and computer vision because they acknowledge, from the outset, the inherently discrete nature of the data to be processed and thus provide theoretical sound, yet computationally efficient frameworks for *digital* image analysis in two and higher dimensional spaces. Important recent results include methods for the representation and analysis of topological maps, fast algorithms for three-dimensional skeletons, topological watersheds, connected filters, and hierarchical image segmentation, as well as application-specific ones in areas such as remote sensing, medical imaging, and document analysis.

The successful DGCI conference series (“Discrete Geometry for Computer Imagery”) has become the main forum for experts in the field of discrete geometry. However, no corresponding forum for the exchange of ideas between experts and potential users existed to date. The same applies to mathematical morphology where the main conference ISMM (“International Symposium on Mathematical Morphology”) is mainly targeted at experts in a similar way.

The First Workshop on Applications of Discrete Geometry and Mathematical Morphology (WADGMM 2010) was held at the International Conference on Pattern Recognition (ICPR) 2010 in Istanbul in order to close this gap. It was specifically designed to promote interchange and collaboration between experts in discrete geometry/mathematical morphology and potential users of these methods from other fields of image analysis and pattern recognition. It comprised four invited review talks by leading researchers in the field and 18 poster presentations of new research results that had been selected among 25 submissions. This volume presents greatly enhanced and thoroughly reviewed versions of selected contributions that nicely reflect the diversity of discrete geometry and mathematical morphology applications and offer, as we hope, a variety of useful tools for the image analysis practitioner.

The workshop was organized by the Technical Committee 18 on Discrete Geometry of the International Association for Pattern Recognition (IAPR). We would like to take the opportunity to thank IAPR for their continuing support of our activities. We are also very grateful to the Organizing and Program Committees, who did a great job in making WADGMM 2010 a success. Last but not least, many thanks go to the authors and to the invited speakers (Peer Stelldinger, David Coeurjolly, Jacques-Olivier Lachaud, Laurent Najman, and Pierre Soille) who kindly accepted our invitation to present their work at the workshop and in this extended volume.

June 2012

Ullrich Köthe
Annick Montanvert
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