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# Combinatorial Image Analysis

14th International Workshop, IWCIA 2011  
Madrid, Spain, May 23-25, 2011  
Proceedings

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# Preface

This volume includes the articles presented at the 14th International Workshop on Combinatorial Image Analysis, IWCIA 2011, held in Madrid, Spain, May 23–25, 2011. The 13 previous meetings were held in Paris (France) 1991, Ube (Japan) 1992, Washington D.C. (USA) 1994, Lyon (France) 1995, Hiroshima (Japan) 1997, Madras (India) 1999, Caen (France) 2000, Philadelphia (USA) 2001, Palermo (Italy) 2003, Auckland (New Zealand) 2004, Berlin (Germany) 2006, Buffalo (USA) 2008, and Playa del Carmen (Mexico) 2009.

Over the last 20 years, the IWCIA series has been promoting research on combinatorial approaches to image analysis and processing. In many cases, the proposed solutions have appeared to be more efficient and accurate than those based on continuous models and numeric computation.

Following the call for papers, IWCIA 2011 received 60 submissions. After a rigorous review process, 25 of them were accepted for oral presentation and 13 for poster presentation and for inclusion in this volume. The IWCIA 2011 Program Committee consisted of 81 renowned experts from 26 different countries, and submissions came from about 20 different countries from Asia, Europe, North and South America. The submission and review process was carried out with the help of the *OpenConf* conference system. Review assignments were largely done matching paper topics to topics of expertise indicated by the reviewers. The reviewing process was quite rigorous: each paper received at least three double-blind reviews by members of the Program Committee. The most important selection criterion for acceptance or rejection of a paper was the overall score received. Other criteria included: relevance to the workshop topics, correctness, originality, mathematical depth, clarity, and presentation quality. We believe that as a result, only high-quality papers were accepted for presentation at IWCIA 2011 and for publication in the present volume.

The scientific program of the workshop included oral and poster presentations of contributed papers, as well as keynote talks by four distinguished researchers: Jake Aggarwal, Valentin Brimkov, Concettina Guerra, and Sebastián Cerdán. In addition to the main theoretical track of IWCIA 2011, for the third time a Special Track on Applications was organized. It provided researchers with the opportunity to present their latest achievements and discuss various applications.

The present volume starts with a section containing extended abstracts of the four keynote talks. The contributed papers are grouped into six sections. The first two sections include 16 papers related to digital geometry. The first one is devoted to more general issues, such as digital topology and combinatorics in digital spaces, while the second one is focused on curves and surfaces. The third section contains eight papers on grammars and models for image analysis and related tilings and patterns. The fourth section includes five papers on discrete

tomography. The next one contains five papers on image segmentation, reconstruction, compression, and fuzzy and stochastic image analysis. The last section includes five papers addressing applications in medical imaging and biometrics. We hope that many of these papers are of interest to a broader audience, including researchers working in areas such as computer vision and computer graphics.

We would like to thank everyone who contributed to the success of IWCI 2011. First of all, the Chairs are indebted to IWCI's Steering Committee for endorsing the candidacy of Spain and Madrid for the 14th edition of the Workshop, as well as to the keynote speakers Jake K. Aggarwal, Valentin E. Brimkov, Concettina Guerra, and Sebastián Cerdán for their remarkable talks and overall contribution to the workshop program.

Our most sincere thanks go to the IWCI 2011 Program Committee whose cooperation in carrying out high-quality reviews was essential in establishing a very strong workshop program. We wish to thank everybody who submitted their work to IWCI 2011. Thanks to their contributions, we succeeded in having a technical program of high scientific quality. We are indebted to all participants and especially to the contributors of this volume. We hope that the attendees benefited from the scientific program and got inspired with new ideas. We also believe they enjoyed the social program and the excellent conditions provided by the local organizers from the Universidad Autónoma de Madrid. Finally, we express our gratitude to the Springer editorial team, in particular to Alfred Hofmann and Anna Kramer, for their efficient and kind cooperation in the timely production of this book. This book is published with financial support from the Grant TIN2010-11021-E of MICINN, Spain.

May 2011

Jake K. Aggarwal  
Reneta P. Barneva  
Valentin E. Brimkov  
Kostadin Koroutchev  
Elka Korutcheva

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