

Preface

The 5th International Conference on Scale Space and Variational Methods in Computer Vision (SSVM 2015, <http://ssvm2015.math.u-bordeaux.fr/>) was held in the picturesque village of Claouey at Lège-Cap Ferret in the Arcachon bay, France. Following the previous meeting, we kept the style of gathering people in a slightly remote and scenic place in order to encourage fruitful discussions during the day and in the evening. This conference, born in 2007 in Ischia, Italy, has become a major event in the communities with common research interests in scale space, variational, geometric, and level set methods and their numerous applications in computer vision and more generally in imaging science. SSVM 2015 was announced mid-May 2014 and it attracted the attention of an important international scientific audience of authors coming from more than 16 countries. We received 83 double-blind submissions. The papers underwent a peer-review process similar to that of high-level journals in the field: each paper was reviewed by at least three members of the Program Committee as well as by other referees. The reviews and the papers were then considered by the Conference Chairs. We recognize P. Arias Martinez, R. Duits, J. Rabin, G. Steidl, and J. Weickert for significant referee work on manuscripts submitted to the conference. Finally, 56 manuscripts were retained for SSVM 2015. Among them, 24 articles were selected for oral presentation and 32 for poster presentation. All these 12-page length original articles are contained in this book. A best student paper award was given during the conference.

Following the tradition of the previous SSVM conferences, we invited outstanding scientists to give keynote presentations. This year, we were happy to welcome the following invited keynote lectures:

- Gabriele Steidl (University of Kaiserslautern, Germany): “Second Order Non-Smooth Variational Models for Restoring Manifold-Valued Images”;
- Alfred Hero (University of Michigan, USA): “Combinatorial Continuum Limits and Their Applications”;
- Jean-Michel Morel (École Normale Supérieure de Cachan, France): “A Review of Image Denoising Methods”;
- Marc Teboulle (Tel Aviv University, Israel): “Algorithms for High Dimensional Structured Optimization.”

Also, we hosted the Editorial Board meeting of the Journal of Mathematical Imaging and Vision (JMIV) since many members were attending the conference, with the participation of Courtney Clark, Editor at Springer assisting with JMIV. Further, selected papers will be considered for a special issue of JMIV “Scale-Space and Variational Methods” thanks to the Editor-in-Chief, Joachim Weickert.

We would like to thank the authors for their contributions and the members of the Program Committee and the other referees for their time and valuable comments during the review process. We are grateful to the organizers of the previous editions of this conference for precious tips on how to organize the event: Fiorella Sgallari (SSVM

2007), Xue-Cheng Tai (SSVM 2009), Yana Katz (SSVM 2011), Arjan Kuijper (SSVM 2013) who gave us the most fresh information, as well as Joachim Weickert. Further, we would like to thank Karine Lecuona, Annie Nadeau, and Cathy Métivier (CNRS) for their enthusiastic help in financial management. Finally, we are lucky to acknowledge the generous support of Cluster of excellence CPU, Institut Universitaire de France, Centre National de la Recherche Scientifique (CNRS), and CNRS national network “Mathematics in Imaging sciences and Applications” (GDR MIA).

The manuscripts of all past SSVM editions were published by Springer in the series Lecture Notes in Computer Science as well: LNCS 4485 (Ischia, Italy 2007), LNCS 5567 (Voss, Norway 2009), LNCS 6667 (Ein Gedi, Israel 2011), and LNCS 7893 (Leibnitz, Austria 2013). It is interesting to observe the evolution of the topics covered by this conference. They naturally reflect the progress of mathematical and application-driven ideas in the field as well as the advent of powerful computers. This is expressed by the interest in more realistic mathematical models, the use of novel mathematical tools for modeling and for scientific computing, the advance in the processing of huge data volumes (e.g., in video and in 3D, among others). These new trends are well represented in this book.

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