Computational Vision and Medical Image Processing

VIPIMAGE 2015

João Manuel R.S. Tavares
R.M. Natal Jorge

EDITORS

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Computational Vision and Medical Image Processing V

Editors

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Preface

This book contains invited lectures and full papers presented at VipIMAGE 2015—V ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing, which was held in Tenerife, Canary Islands, Spain, during the period 19–21 October 2015. The event had 6 invited lectures, and 50 contributed presentations originated from 19 countries: Algeria, Brazil, China, Czech Republic, Egypt, France, Germany, Hungary, Italy, Mexico, Norway, Poland, Portugal, Romania, Russia, Spain, The United Kingdom, The United States of America and Turkey.

Computational methodologies of signal processing and analyses have been commonly used in our society. For instances, full automatic or semi-automatic Computational Vision systems have been increasing used in surveillance tasks, traffic analysis, recognition process, inspection purposes, human-machine interfaces, 3D vision, deformation analysis and aided medical procedures.

One of the notable aspects of the Computational Vision domain is the inter- and multi-disciplinarily. Actually, principles and methodologies of other sciences, such as Informatics, Mathematics, Statistics, Psychology, Mechanics and Physics, are regularly embraced into this domain. One of the key motives that contributes for the continually effort done in this field of the human knowledge is the high number of applications that can be easily found in Medicine. For instance, computational algorithms can be applied on medical images for shape reconstruction, motion and deformation analysis, tissue characterization or computer-assisted diagnosis and therapy.

The main objective of these ECCOMAS Thematic Conferences on Computational Vision and Medical Image Processing, initiated in 2007, is to promote a comprehensive forum for discussion on the recent advances in the related fields in order to identify potential collaboration between researchers of different sciences. Henceforth, VipIMAGE 2015 brought together researchers representing fields related to Biomechanics, Biomedical Engineering, Computational Vision, Computer Graphics, Computer Sciences, Computational Mechanics, Electrical Engineering, Mathematics, Statistics, Medical Imaging, Medicine and Rehabilitation.

The expertises spanned a broad range of techniques for Signal Processing and Analysis, Image Acquisition, Image Processing and Analysis, Data Interpolation, Registration, Acquisition and Compression, Image Segmentation, Tracking and Analysis of Motion and Deformation, 3D Vision, Computer Simulation, Medical Imaging, Computer Aided Diagnosis, Surgery, Therapy and Treatment, Computational Bio-imaging and Visualization, Telemedicine, Virtual and Enhanced Reality, Satellite imagery, Software Development and Applications.

The conference co-chairs would like to take this opportunity to express gratitude for the support given by The International European Community on Computational Methods in Applied Sciences and The Portuguese Association of Theoretical, Applied and Computational Mechanics, and thank to all sponsors, to all members of the Scientific Committee, to all Invited Lecturers, to all Session-Chairs and to all Authors for submitting and sharing their knowledge.

João Manuel R.S. Tavares
Renato M. Natal Jorge
Conference Co-Chairs

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Invited lectures

During VipIMAGE 2015, Invited lectures were delivered by 6 Expertises from 4 countries:

- Alexandre Xavier Falcão, *Universidade de Campinas, Brazil*
- Cristian A. Linte, *Mayo Clinic, USA*
- Fiorella Sgallari, *University of Bologna, Italy*
- Yongjie Zhang, *Carnegie Mellon University, USA*
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All works submitted to VipIMAGE 2015 were evaluated by an International Scientific Committee composed by 116 expert researchers from recognized institutions of 26 countries:

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