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Special issue: IV ECCOMAS thematic conference on computational vision and medical image processing (VipIMAGE)

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EDITORIAL

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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 increasingly used in surveillance tasks, traffic analysis, recognition process, inspection purposes, human machine interfaces, 3D vision and deformation analysis.

One of the notable aspects of the Computational Vision domain is the inter and multidisciplinary. Actually, methodologies of more traditional sciences, such as Informatics, Mathematics, Statistics, Psychology, Mechanics and Physics, are regularly comprised in this domain. One of the key motives that contribute to the continual 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 characterisation or computer-assisted diagnosis and therapy.

These two special issues of the journal *Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization (CMBBE: Imaging & Visualization)* contains the extended versions of 12 papers presented at the *IV ECCOMAS Thematic Conference in Computational Vision and Medical Image Processing (VipIMAGE 2013)*.

The main objective of the *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 2013* brought together to Madeira Island researchers representing fields related to Biomechanics, Biomedical Engineering, Computational Vision, Computer Graphics, Computer Sciences, Computational Mechanics, Electrical Engineering, Mathematics, Statistics, Medical Imaging and Medicine.

These extended works were reviewed according to the *CMBBE: Imaging & Visualization* policy. They present and discuss new trends in those fields using several novel methods and techniques and addressing different applications: Rosa and Monteiro compare techniques that have been used in the smoothing of speckle noise in ultrasound images; *Boroto-Fernández et al.* propose an efficient smoothing algorithm that preserves edges and provides valuable information for segmentation processes; the problem of metal artefact reduction in CT images is addressed by Faggiano

et al. based on a fourth-order total variation flow; Lachiondo et al. investigate the use of Legendre moments as biomarkers for an efficient and accurate classification of bone tissue on images taking into account computational methods and GPU acceleration; methods proposed for the identification of fractured bone tissue from CT images are reviewed by Paulano et al.; Ricordeau and Mellouli explore the potential ability of a 3D-skeleton coupled with a statistical tensor analysis to locally describe the trabecular structure for binary images towards the simulation of bone remodelling process; Maheshwari et al. propose a robust and accurate method for the reconstruction of standard 12-lead system from Frank vectorcardiographic system; a comparative experiment vs. modelling analysis of the strain-line pattern in the human left ventricle is presented by Evangelista et al.; the automatic tracking and deformation analysis of red blood cells flowing through a microchannel with a microstenosis is studied by Taboada et al.; Tichý et al. suggest a model to extract input and organ functions in dynamic scintigraphic imaging; a new imaging biomarker of prostate cancer aggressiveness based on MR-T2-weighted signal intensity is proposed by Giannini et al.; and finally, Binaghi et al. propose a novel behavioural comparison strategy specifically oriented to accuracy assessment in MRI glial tumour segmentation studies.

The Guest Editors wish to thank all the *VipIMAGE 2013* authors and members of the Programme Committee for sharing their expertise, the *International European Community on Computational Methods in Applied Sciences (ECCOMAS)*, the *Portuguese Association of Theoretical, Applied and Computational Mechanics (APTMAC)*, the "*Universidade do Porto*" (U.Porto) and the "*Instituto de Ciência e Inovação em Engenharia Mecânica e Engenharia Industrial*" (INEGI) for supporting *VipIMAGE*, the authors of the selected manuscripts and also to the *CMBBE: Imaging & Visualization* Editors and Reviewers for helping improve the manuscripts accepted.

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