Editorial Message from the Editor-in-Chief

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Editorial Message from the Editor-in-Chief

I am pleased to welcome you to Volume VII of our journal *Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization*.

This is the first issue of this Volume, and therefore, a good moment to share with you the latest developments of our Journal. In 2018, the Journal continued its growing performance as seen by the following facts: 1) the Journal received a total of 184 submissions from 32 countries: Algeria, Australia, Bangladesh, Belgium, Brazil, Canada, China, Egypt, France, Germany, Greece, Hong Kong, India, Indonesia, Iran, Iraq, Italy, Japan, Jordan, Korea, Lebanon, Malaysia, Portugal, Sweden, Taiwan, Thailand, Tunisia, Turkey, United Arab Emirates, United Kingdom, United States and Viet Nam, which again confirms the worldwide recognition of our Journal; 2) the quality of the works published in the Journal was maintained; 3) in 2018, 67 manuscripts were accepted for publishing while 122 were rejected; making the acceptance rate 37.3%. In the 6 issues of Volume VI, 73 articles were published, briefly:

In the 1st Issue of Volume VI, 13 articles were included: 1) Gao et al. presented a new algorithm, which uses the entire input image as a holistic input to classify interstitial lung diseases using imaging patterns from computed tomography (CT) images; 2) Li et al. proposed a new method for building a sequence of subject-specific and respiration-corrected 3D ultrasound (US) images, from multiple robotic-assisted-swept 2D US image sequences; 3) Tafti et al. studied the performance of four robust feature detection algorithms: SIFT, SURF, BRIEF and ORB, on multi-view 3D surface reconstruction of microscopic samples obtained by scanning electron microscopy (SEM); 4) Nimbarte & Mushrif suggested two efficient approaches for automatic detection of blood vessels and the optic disc in retinal images; 5) Grbatinić et al. studied the modelling of 2D dentate nucleus neuron surfaces based on the response surface methodology; 6) Yeo et al. proposed a new solution for the segmentation of the subcutaneous fat layer in full-body magnetic resonance imaging (MRI) scans; 7) Rizzi et al. delimited the human dental colour subspace described within the Munsell space starting from the most used reference scales available on the market, and conducted a perceptual experiment in order to assess the visual colour discrimination within this subspace; 8) Carneiro et al. used micro-CT imaging to compare the marginal gap of feldspathic ceramic and resin nano-ceramic crowns obtained by two different computer-aided design/computer-aided manufacturing systems; 9) Chen & Huang presented a real-time freehand 3D US imaging system that can obtain volume reconstruction and visualisation during data acquisition in real-time level; 10) Yepes-Calderon et al. introduced a new CT-based pipeline for tumour analysis and characterisation, called EdgeRunner; 11) an overview on cloth simulation for computer graphics and modelling techniques was presented by Basori et al.; 12) Salih et al. described a method for automated optic disc segmentation from colour fundus images; and 13) Bao & Chung proposed a new method for brain MRI segmentation based on deep learning techniques and graphical models.

The 2nd issue had 11 contributions: 1) Singh et al. investigated the feasibility of MRI based haemodynamic assessment of the superficial femoral artery in patients with peripheral artery disease; 2) Nguyen et al. suggested an integrative methodology to create patient-specific finite element models with mesh generation driven by the knowledge of the properties of the materials derived from medical images; 3) a new solution for the fusion of 2D MR myocardial perfusion images and 3D MR angiography data with the aim to improve the detection of ischaemic heart disease was presented by Zakkaroff et al.; 4) Deep & Gupta presented: Local mesh ternary patterns, which is a novel descriptor for MR and CT biomedical image indexing and retrieval; 5) a fully automatic coronary artery centreline tracking algorithm was developed and applied on CT angiography images by Salehi & Naghsh-Nilchi; 6) Wang et al. presented an augmented reality system with stereoscopic visualisation for single camera endoscopy; 7) Rout et al. proposed a solution to compute the similarities and dissimilarities among tertiary protein structures, which is based on fundamental mathematical morphology operations and fractal geometry; 8) Deluce et al. used intra-operative surface-based registration techniques in the development of a new a navigation system for patient-specific radial head implants; 9) a geometric surface parameterisation algorithm along with multiple visualisation techniques adapted to the problem of understanding the 4D peristaltic-like motion of the outflow tract in an embryonic chick heart were presented by Phan et al.; 10) the use of computer vision to analyse and classify scanning electron microscope images of debris, which is a crucial factor in determining the lifespan of a total joint replacement, was explored by Eckold et al.; and 11) the development and implementation of a highly automated CT-based method to quantify 3D posterior element anatomy was addressed by Singh et al..

The 3rd issue of Volume VI was devoted to the *1st MICCAI workshop on Deep Learning in Medical Image Analysis*, which was organized by Gustavo Carneiro, João Manuel R. S. Tavares, Andrew P. Bradley, João Paulo Papa, Jacinto C. Nascimento, Jaime S. Cardoso, Zhi Lu & Vasileios Belagiannis. A total of 14 articles were published in this issue: 1) Dubrovina et al. dealt with mammography images and presented a novel supervised deep learning-based framework for region classification into semantically coherent tissues; 2) a novel deep similarity learning method that trains a binary classifier to learn the correspondence of two image patches was proposed by Cheng et al.; 3) Barbu et al. studied and compared four different

loss functions for deep convolutional neural networks (CNNs) in the context of computer-aided abdominal and mediastinal lymph node detection and diagnosis (CAD) using CT images; 4) Bar et al. studied the feasibility of detecting pathology in chest X-rays using deep learning approaches based on non-medical learning; 5) Achilles et al. studied the used CNNs for real-time epileptic seizure detection; 6) a resolution adaptive deep hierarchical learning scheme wherein deep learning networks at lower resolutions are leveraged to determine if higher levels of magnification, and thus computation, are necessary to provide precise results was proposed by Janowczyk et al.; 7) Thong et al. described a fully automatic framework for kidney segmentation with convolutional networks in contrast-enhanced CT scans; 8) Xie et al. addressed automated cell counting and detection in microscopy images based on fully convolutional regression networks; 9) an evaluation of anatomical parameters of cam femoroacetabular impingement to evaluate hip joint models segmented from CT data was presented by Ng et al.; 10) Agaian et al. presented an image system for the automated classification of peripheral blood smear images of acute lymphoblastic leukaemia containing multiple nuclei; 11) the classification of regions of interest extracted from mammograms into masses and non-masses was studied by Silva et al.; 12) Hu et al. addressed the quality improvement of tetrahedral and hexahedral meshes built from images using anisotropic Giaquinta-Hildebrandt operator; 13) a computerised method to distinguish between normal and arrhythmia heartbeats from electrocardiogram signals was developed by Dhar et al.; and 14) Wang & Al-Jumaily described the working principle of the holographic electromagnetic induction method for imaging small lesions in arbitrarily shaped biological objects.

The 4th issue of 2018 contains 12 articles and was devoted to the V ECCOMAS thematic conference on computational vision and medical image processing (VipIMAGE) organized by João Manuel R. S. Tavares & Renato Natal Jorge: 1) the segmentation of meningioma and peritumoral edema from multispectral brain MR imagery was studied by Binaghi et al.; 2) the possibilities of mobile and wearable devices in a fracture reduction process are introduced and discussed by Jiménez-Pérez et al.; 3) Moraes et al. proposed and evaluated a novel isosurface rendering method for medical images improved by automatic texture mapping; 4) Mihailescu et al. examined whether cervical cells qualify as normal or abnormal on the basis of phase profiles, and subsequently performed local fractal descriptions of their 3D holographic images; 5) an application of augmented reality that can be used as a support for more accurate preoperative surgical plans and for image-guided procedures was proposed by De Paolis & Ricciardi; 6) Veiga et al. proposed a novel approach based on Laws texture features to detect microaneurysms, which was applied on colour fundus images; 7) the applicability of the mesh generation methods, Marching Cubes, Ball-pivoting, Poisson reconstruction and Algebraic Point Set Surface, to model bone fragments was studied by Paulano-Godino et al.; 8) Oliveira et al. presented an overview of the capabilities of Nuclear Medicine to help oncological practice through diagnosis and therapy; 9) Galbusera et al. developed a neural network for the automatic identification of vertebral landmarks in radiographic images; 10) Lu et al. explored whether novel parameters, derived from a Dual-energy X-ray absorptiometry (DXA) scan, might improve fracture risk estimation; 11) the development and evaluation of a computerized melanoma image analytical system was presented by Katapadi et al.; and 12) a method of immunostained tissue scoring based on maximal separation techniques was proposed by Hameed et al..

The 5th issue of Volume VI is a special issue devoted to Biomechanical and Parametric Modelling of Human Anatomy (PMHA-2015) that was organized by Sidney Fels & Ian Stavness and included 12 articles: 1) a musculoskeletal model of the lumbar spine using ArtiSynth was developed and validated by Malakoutian et al.; 2) Smith et al. assessed the use of an advanced collision detection algorithm to simulate cartilage contact pressure patterns within dynamic musculoskeletal simulations of movement; 3) the muscle architecture of the tongue of 14 people captured in high-resolution 3D MR imaging volumes was studied by Stone et al.; 4) the effect of muscle stiffness and co-contraction on postural stability was simulated by Shabani & Stavness; 5) Woo et al. proposed a spatio-temporal atlas and statistical model of the tongue during speech from cine-MRI; 6) Tran et al. visualized improved swallowing mechanics resulting from respiratory-swallow phase training using patient-specific computational analysis of modified barium videofluoroscopic swallowing images; 7) Ho et al. proposed a new method for extracting solid boundary motion from dynamic CT images of a human oropharyngeal swallow; 8) Rutkowski et al. used MRI, computational fluid dynamics modelling and in vitro experiments to predict patient-specific alterations in hepatic haemodynamics in response to partial hepatectomy in living liver donors; 9) the pose-induced errors of knee, ankle and hip joints by taking simulated X-ray images of knee prosthesis were studied by Lin et al.; 10) a new method for automatically reducing the variability of manual and semi-automatic seed-based segmentation methods with respect to the seed point location without compromising the target structure segmentation accuracy was suggested by Kronman & Joskowicz, who applied it to segment kidneys and livers in CT images; 11) a method to recognize overlapping and multi-dimensionalities actions in images was proposed by Ahad et al.; and 12) a fusion algorithm, which combines the dual-tree complex wavelet transform with principal component analysis, was proposed by Aktar et al. in order to perform fusion on various medical imaging modalities.

The 6th and last issue of 2018 had 11 articles: 1) Ross et al. studied the propagation of errors in two methods used to determine tibial contact locations using single-plane fluoroscopy imaging following total knee arthroplasty; 2) a novel real-time solution to detect and segment abnormal facial regions in images was suggested by Goceri & Gunay; 3) several dimension reduction approaches were applied on mammograms by Ebrahimpour et al. in order to enhance the prediction power in a typical Computer-Aided Detection/Diagnosis system; 4) cell-free layer measurements of in vitro blood flow in a microfluidic network were conducted by Bento et al. using a high-speed video microscopy system; 5) a new solution using a histogram-based fuzzy C-means algorithm and

morphological mathematical algorithms for lung segmentation in CT images was proposed by Doğanay *et al*.; 6) Sengar & Dutta described a new automated method for comprehensive detection and grading of non-proliferative diabetic retinopathy in colour fundus images; 7) Kim *et al*. studied the intra- and inter-operator reliability, and CT scan repeatability in 3D modelling of talus bone using CT imaging; 8) a technique that enables interactive exploration of medical image atlases, which permits the hierarchical structure of the atlas and the content of an underlying medical image to be investigated simultaneously, was proposed by McGraw & Guayaquil-Sosa; 9) Huang *et al*. presented the design of an adaptive control and virtual reality-based fine hand motion rehabilitation system and studied its effects in subacute stroke patients; 10) a new feature descriptor called "local quantized extrema quinary pattern" was proposed for biomedical image indexing and retrieval by Deep & Gupta; and 11) Prathibha & Mohan addressed the classification of mammograms from digital databases for screening mammography using bandelet and orthogonal ripplet type II transforms.

In order to recognise the outstanding quality of the articles published, the Editorial Board established the *Best Paper Award* for the best paper published in the Journal each biennium. The best paper is selected from the manuscripts published each biennium by the Editor-in-Chief, Associated Editors and members of the Advisory Board of the Journal, based on the originality of the contribution and readability of the manuscript. For the 2017-2018 biennium, I am delighted to announce that the winner is the article *Microscopy cell counting and detection with fully convolutional regression networks* by Weidi Xie, J. Alison Noble & Andrew Zisserman; moreover,

I would like to thank them for choosing our Journal to publish their inspiring work and congratulate them on the quality of their article.

I would like to take this opportunity, once again, to thank the members of the Advisory and Editorial Boards whose international recognition and dedication to the Journal has been crucial for the continued widespread growth of our Journal. As always, a particular acknowledgment goes to the Associated Editors, Dr Zeyun Yu, Dr Jun Zhao, Dr Daniela Iacoviello and Dr Vicky Kalogeiton, for continuing their role in helping me run the Journal. I feel privileged to have such a talented and professional group of editors working with me on this journal. My thanks also go to the Taylor & Francis group that has worked with me since the inaugural issue in 2013, and whose continuous support has been vital for the management and dissemination of our Journal.

Computer Methods in Biomechanics and Biomedical Engineering: Imaging Visualization is attracting promising authors and readers from the best worldwide related research groups and forums. For that, special issues have been fundamental in gathering new authors working on pioneering topics, solutions and applications related to bio-imaging and -visualization; therefore, proposals for special issues will always be welcome.

Besides Editorial Boards, the authors and the readers are fundamental for the successfully establishment of a journal in the scientific community. Hence, you all have played a highly valued role in the success of our Journal.

João Manuel R. S. Tavares (Editor-in-Chief)