

## Editorial

The Transactions on Computational Science journal is part of the Springer series *Lecture Notes in Computer Science*, and is devoted to the gamut of computational science issues, from theoretical aspects to application-dependent studies and the validation of emerging technologies.

The journal focuses on original high-quality research in the realm of computational science in parallel and distributed environments, encompassing the facilitating theoretical foundations and the applications of large-scale computations and massive data processing. Practitioners and researchers share computational techniques and solutions in the area, identify new issues, and shape future directions for research, as well as enable industrial users to apply the presented techniques.

The current issue consists of two parts. Part I is a Special Issue on Computer Vision/Image Processing Techniques and Applications edited by Prof. Khalid Saeed, Prof. Nabendu Chaki, and Associate Prof. Soharab Hossain Shaikh. Part II is devoted to Optimization and Networks, and covers a range of topics in social context-based computing, clustering, risk analysis, array restructuring, wireless sensor networks, and feed forward neural networks.

Part I is comprised of six papers, spanning areas of computer vision, image processing for biometric security, information fusion, and KINECT activity recognition. The full description of contributions and impact of those papers can be found in the Guest Editors' Foreword.

Part II is comprised of five papers united by the theme of optimization through novel methods for data fusion, clustering in WSN, fault-tolerance, probability, weight assignment, and risk analysis. These papers cover the topics of context-based social analysis for gait recognition, cluster head selection using weight and rank in WSN, multiple weight-and-neuron-fault-tolerance in feedforward neural networks, and optimization through coded and space-time cooperation with multiple relays in Nakagami-m fading. In addition, a new circuit for restructuring mesh-connected processor arrays is proposed and an urban railway operation plan is studied. The first article of Part II was initially submitted to the Special Issue on Advances in Autonomic Computing: Formal and Practical Aspects of Context-Aware Systems, while all other articles were submitted as regular papers.

We would like to extend our sincere appreciation, first and foremost, to the Special Issue Guest Editors Khalid Saeed, Nabendu Chaki, and Soharab Hossain Shaikh who assembled a fine collection of papers after a rigorous multistage refereeing process and who have demonstrated a high degree of professionalism and dedication to excellence. We also would like to thank all renewed members of the TCS Editorial Board for over five years of their service. We acknowledge the contribution of the external reviewers and thank them for their diligence and critical comments in preparing this issue. Last, but not least, we would also like to thank all of the authors for submitting their papers to the Journal. We are very grateful to the LNCS editorial staff of Springer, who supported us at every stage of the project.

We hope that this issue will be a valuable resource for Transactions on Computational Science readers and will stimulate further research into the vibrant area of computational science applications, including image processing, biometric security, and network optimization.

March 2015

Marina L. Gavrilova  
C.J. Kenneth Tan

# **Guest Editors' Preface**

## **Special Issue on Computer Vision/Image Processing Techniques and Applications**

Over the last few decades, image processing and computer vision communities have been one of the dominant contributors in the field of research in Computer Science. The primary focus of the researchers concentrated on developing novel techniques for computer vision and image processing problems; emerging and innovative applications of computer-vision-based applications as well as theoretical contributions that are relevant to computer vision and image processing.

Papers submitted to this Special Issue of Springer's Transactions on Computational Science focusing on "Computer Vision/Image Processing Techniques and Applications" aimed at providing a comprehensive understanding of the fundamentals as well as the cutting-edge technologies and innovative applications of computer vision and image processing techniques.

There were several rounds in the review process for selecting the papers for the final publication. This Special Issue contains six selected papers out of more than 12 initial submissions.

Infrared imaging has attracted the attention of researchers for the last few years. Infrared devices capture only the heat-emitting objects. Visualization of the IR images is very poor due to low contrast of the images. Improvement in quality is required for a given IR image toward better perception and visualization. The first paper uses the concepts of fuzzy sets for visualization and enhancement of infrared images. Experimental verification on a standard benchmark database shows the efficacy of the presented method.

The second paper provides a fresh perspective on the technique of dance composition. Dance composers are commonly required to ensure a smooth flow of inter-gesture dance transitions. This paper presents an approach by incorporating the differential evolution algorithm to compose interesting dance patterns from a set of dance sequences. Authors make use of the Microsoft Kinect sensor for generating a skeletal image of the subjects.

A framework for moving object segmentation in maritime surveillance is presented in the third paper. This paper also considers the issue of dynamic changes in the background of the images.

A novel technique of feature extraction for content-based image identification is presented in the fourth paper. The new technique is named Sorted Block Truncation Coding (SBTC). The experimental results on the benchmark dataset prove the effectiveness of the proposed methodology. The SBTC feature extraction technique has also shown consistent performance in a compressed domain without having any significant degradation in classification performance.

The subjective evaluation method of usability is costly and time-consuming, and sometimes produces more unreliable data than the objective evaluation method because of the subjective view. On the other hand, the objective evaluation method is traditionally useful and reliable, but expensive. The fifth paper presents a method for objective evaluation of usability using parameters of user's fingertip movements.

The last paper addresses the importance of using image fusion techniques in the context of medical image processing. This paper uses Daubechies Complex Wavelet and the concept of Near Set for fusing medical images.

Let us take this opportunity to thank all the authors who submitted their manuscripts to this Special Issue and all the reviewers for their invaluable contributions to the reviewing process. We express our special appreciation and deep regards for Prof. Marina Gavrilova, the Editor-in-Chief of Springer's Transactions on Computational Science, for her untiring encouragement and support.

This Special Issue on "Computer Vision/Image Processing Techniques and Applications" provides the reader with interesting new insights into contemporary research with a focus on quantitative performance analysis from multiple aspects of computer vision ranging from image fusion to newer approaches to methodologies for dance composition. All six of the papers make valuable contributions and we hope that the readers of TCS journals will enjoy this Special Issue.

March 2015

Khalid Saeed  
Nabendu Chaki  
Soharab Hossain Shaikh

Transactions on Computational Science XXV

Gavrilova, M.L.; Tan, C.K.; Saeed, K.; Chaki, N.; Shaikh,  
S.H. (Eds.)

2015, XIV, 201 p. 94 illus., Softcover

ISBN: 978-3-662-47073-2