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## Preface

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Information technologies play a crucial role in promoting the quality of human life. This special issue covers the essential techniques for improving information systems regarding human life. Studies on digital life provide a convenient environment by integrating many information technologies. Management and retrieval techniques for digital content are different from those for conventional data. Parties involved in a smart home cover nearly all identities, including human, software, hardware, and environment, and thus there is a need for software engineering within such a new paradigm.

Studies on image processing, watermarking and 3D computer graphics have been the major concerns in recent information technology. The integration of these techniques can provide effective solutions for multimedia and digital contents conducted in the modern network architectures, such as the cloud environment. New results and innovations in algorithms and network analyses are also the basis of the research on information systems.

The papers in this special issue are selected from 2011 National Computer Symposium, Taiwan. Totally, there were 264 papers presented in the symposium. These six distinguished papers were selected by the programme committee. The papers were extended before submission to this journal. Then the papers went through a process of review and revision. The guest editors would like to thank the reviewers for their valuable comments.

The first paper in this special issue is on 'Effective forgery detection using DCT+SVD-based watermarking for region of interest in key frames of vision-based surveillance', by Wu-Chih Hu and Wei-Hao Chen. The paper proposes a hybrid watermarking scheme based on the discrete cosine transformation (DCT) and singular value

decomposition (SVD) to apply to the forgery detection for regions of interest (ROI) in key frames of video surveillance. The method has good performance in the detection of illegal forgery of vision-based surveillance.

The second paper is 'An exact method for estimating maximum errors of multi-mode floating-point iterative Booth multiplier', by Kun-Yi Wu, Shiann-Rong Kuang, and Kee-Khuan Yu. Floating-point multipliers have become the main energy consumers in embedded systems. The paper trades output quality with energy consumption via reducing the precision of FP multiplication operations to less accurate. This paper proposes a multi-mode FP iterative Booth multiplier that can provide multiple precision modes (PM). To efficiently assign each multiplication operation in an application to a proper PM for satisfying output error constraint and achieve more energy saving, an exact analysis method is proposed to estimate the maximum error of each PM.

The third paper is 'Novel view image synthesis based on photo-consistent 3D model deformation', by Meng-Hsuan Chia, Chien-Hsing He, and Huei-Yung Lin. The paper performs model refinement with camera information of the novel view. The authors use the reconstructed visual hull from shape from silhouette and then refine the 3D model based on the view dependency. The 3D points are classified as the outline points or the non-outline points by novel view. The former corrects the shape of the model and the latter improves the colour accuracy in the synthesised image. The paper designs suitable energy functions according to two different types of 3D points, which consist of photo-consistency, contour/visual hull and surface smoothness.

The fourth paper is 'Selection of canonical images of travel attractions using image clustering and aesthetics analysis', by Jen-Chang Liu, Yin-Chen Liang, and Shih-Wei Lin. The paper proposes an approach for finding canonical images of travel attractions from online social platforms. Aesthetics analysis is applied to rank the results. The methods used include face detection to filter attractions images containing people, feature extraction, and feature classification to filter out background features. The paper calculates the similarity among images, and applies an affinity propagation algorithm for clustering the canonical images. Finally, the clustered images are ranked by aesthetics scores.

The fifth paper is 'Parallel approximation algorithms for minimum routing cost spanning tree', by Kun Chen, Yung En Hsieh, and Ping Jung Lu. The internet should provide high quality of service to ensure media or sounds can be transferred smoothly. Finding the minimum routing cost spanning tree is important and is an NP-hard problem. The authors propose two MRCT approximation algorithms with parallel-computing methods and obtain impressive experiment results with reduced calculation time. Furthermore, the paper considers the load balance for each thread by using the thread pool so that use of each CPU can be improved.

The last paper in this special issue is 'Data flow analysis and testing for OWL-S semantic web service compositions', by Chien-Hung Liu, Shu-Ling Chen, and Teng-Yi Huang. This paper proposes a data flow testing approach for web service compositions based on web ontology language for service (OWL-S). The data flow test artefacts introduced by OWL-S are identified and thoroughly analysed. A test model that considers a variety of control constructs and semantics of OWL-S is proposed to abstract these test artefacts. Based on the test model, test paths can be derived to effectively uncover defects caused by improper data handling and message exchanges of OWL-S service compositions.

Special thanks are due to the Editor-in-Chief of *IJCSE*, Professor Kuan-Ching Li, for his help with this special issue. The excellent support from the team of Inderscience Publishers is very much appreciated. We hope that this special issue will represent a timely and significant reference for future researches.