GUEST EDITORIAL PREFACE

Advances in Machine Vision, Image Processing and Pattern Analysis, Part 2

Nilanjan Dey, BCET, Durgapur, India

Vikrant Bhateja, Shri Ramswaroop Memorial Group of Professional Colleges (SRMGPC), Lucknow, India

Jitendra Virmani, Jaypee University of Information Technology, Waknaghat, India

A lot of advancements have been made recently in the field of image processing and pattern analysis. This special issue of IJSDA aims to focus upon the latest developments in theory, methodologies and applications in the highly interdisciplinary research arena of machine vision, image processing and pattern analysis. The theme addresses mathematical, physical, architectural and computational aspects of machine vision, analysis, matching and recognition along with its subsequent connection with Human Vision System (HVS). Further, it is known that computational intelligence serves as a powerful tool to mimic and process human knowledge. The integration of artificial intelligence, soft computing and machine learning adds to various computational enhancements in machine vision and image processing.

This special issue (vol. 4, no. 3) is in continuation (Part 2) of our previous one (vol. 4, no. 2) consisting of the extended version of papers which were initially presented at the Third International Conference on Frontiers in Intelligent Computing: Theory and Applications (FICTA-2014) held during 14–15 November 2014 at Bhubaneswar (Odisha), India. This conference was jointly organized by Bhubaneswar Engineering College (BEC), Bhubaneswar, India and CSI Student Branch, ANITS, Vishakhapatnam (A.P.), India. FICTA 2014 received a good number of submissions from the different areas relating to intelligent computing; finally with the acceptance ratio of 0.43, its proceedings were published as Vol. 327 & 328 of Springer Advances in Intelligent Systems and Computing (AISC) Series.

The present issue comprises of four articles which are the shortlisted papers published under special session on 'Advanced research in Computer Vision, Image and Video Processing' under FICTA 2014. The aggregation of articles published under this issue have been compiled

to present advancements in video text analysis, video surveillance, forgery detection along with image fidelity assessment.

The first article in this issue by Sudhir and Ravishankar presented an edge and texture based approach towards curved video text detection. The proposed framework for video text detection has been robust enough to handle both graphics as well as scene curved texts. The prime contributions of the proposed work include wavelet based text saliency detection technique followed by LU decomposition based curved text localization approach (a fast texture descriptor). A connected component filtering method followed by B-Spline curve fitting on centroid of each character vertically aligns each oriented character. The aligned text string is then recognized by Optical Character Recognition (OCR). The proposed framework performs well for curved text videos and achieves higher precision and F-measure than previous works.

The second article by Chandrakanth and Sandhya focussed upon analysis of Structural Similarity index (SSIM) based quality assessment across color channels of images. The analysis process involves quality assessment of color images using SSIM metric across various color spaces. CIE Lab which is a perceptually uniform color space, has been deployed here for color based Image Quality Assessment (IQA). Experiments are carried out to study the effect of color spaces in metric based and distance based quality assessment. Further, it has been concluded that the proposed metric using CIE Lab color space and SSIM, has better correlation to the subjective assessment.

The third article in the sequence by Ahmed et al. introduces four algorithms for performing automated detection of unnatural activity in a visual surveillance system. In the proposed algorithms, the complexities are found independent of time; making them well suited for online applications. The proposed algorithms have been experimentally validated on labelled data sets from two complementary environments. Authors' have shown that the proposed algorithms achieve a higher detection rate for a given false-alarm tolerance level and also meets the timing constraints enforced by real-time applications. Analyses of the sensitivities of the important parameters of the proposed algorithms have shown that performances are not very sensitive to optimum parameter selection.

The last article presents a method to detect copy-move forgery in single and multiple regions from a given image. In this work, Pandey et al., introduced Copy-Move Forgery Detection (CMFD) process which operates using Speed-Up Robust Features (SURF), Histogram Oriented Gradient (HOG), Scale Invariant Features Transform (SIFT) and hybrid features such as: SURF-HOG and SIFT-HOG. Given a suspected image, SURF and SIFT based proposed CMFD method reliably detects if a certain region has been duplicated. The main contribution of the work comprises detection of single and multiple copy-move forgery in an image as object or scene which is geometrical and photometric transformed.

To sum up, the present issue has highlighted recent updates in methodologies involving features extraction to improve the performance of machine vision tasks like: video text detection, video surveillance, forgery detection and objective evaluation of image quality. The collected papers provide interesting and promising advances of the state of the art trends in pattern analysis with respect to images and videos. As guest editors we hope that spectrum of research works covered under this special issue will be of value for multitude of readers. At the same time, we are grateful to the authors for making their valued research contributions to this issue and their patience in crucial revision stages.

The technical standards and quality of published content is based on the strength and expertise of the reviewer board members who have been grossly involved in providing high quality reviews for the submitted papers. Our special thanks goes to the Editor-in-Chief of the International Journal on Systems Dynamics Applications (IJSDA), Dr. Ahmad Taher Azar, Benha

Unversity, Egypt, for all his help, support, efficiency and competence rendered to this special issue. Last, but not the least our heartfelt thanks are due to Prof (Dr.) Suresh Chandra Satapathy, Corresponding Editor of Springer AISC Series FICTA 2014 (Chairman- Division-V: Education and Research, Computer Society Of India), in providing active support and collaboration in carrying out selections and making calls to the authors' of quality articles for extension of their work and its subsequent submission in this special issue of IJSDA.

Nilanjan Dey
Vikrant Bhateja
Jitendra Virmani
Guest Editors
IJSDA