
GUEST EDITORIAL

PATTERN RECOGNITION AND IMAGE ANALYSIS IN CYBERNETIC APPLICATIONS

This special issue contains a collection of papers addressing recent and emerging techniques from pattern recognition and image analysis in the context of cybernetics. The issue focuses on novel applications of these techniques to challenging problems from several real-world domains.

Pattern recognition and image analysis constitute two very active interdisciplinary research areas with a wide application scope in many different fields, such as biometrics, character and handwritten text recognition, speech analysis, multimedia, computer vision, remote sensing, medical image analysis, robotics, and so forth.

The five contributions to this issue have been selected from a number of invited papers, which were strictly peer reviewed through a double-blind reviewing process by reputed international referees. The papers in this special issue cover some of the aforementioned topics and constitute a representative sample of the latest developments in cybernetics by using tools from pattern recognition and image analysis.

In particular, the first paper in this issue presents several speech-to-speech translation systems based on finite-state models and implemented on low-cost hardware. The second contribution addresses the problem of intensity and spectral changes caused by natural illumination in outdoor machine vision applications, deriving a suitable method to deal with the effects of illumination changes. The third work proposes a technique for automatic object recognition using an independent component analysis model. The last two papers are on the topic of medical image analysis. The first one introduces a novel approach to image segmentation that is applied to digital angiograms analysis; the last paper presents a method for the registration and correspondence of magnetic resonance and x-ray mammographic images.

Although it is impossible to entirely cover the growing field of pattern recognition and image analysis in a special issue like this one, we think that the papers included here highlight some examples of the potential and recent developments in different applied domains. We hope that this issue provides useful information for further research in pattern recognition and image analysis for cybernetics and that it will be followed by other researchers reporting new developments in this field.

We would like to thank all the authors who submitted their papers to this special issue, for without their effort, interest, and valuable collaboration, this issue would not have been possible. We are also very grateful to the reviewers for their advice and expertise: Aurélio C. Campilho, Adrian F. Clark, José Crespo, Joaquín Fdez.-Valdivia, Christopher G. Healey, George Matas, Majid Mirmehdi, Renato de Mori, Pietro Pala, Maria Petrou, Mario Vento, Juan J. Villanueva, and Reyer Zwiggelaar.

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