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## Foreword

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**Biographical notes:** Dominique Laurent received his doctoral degree in 1987 and his Habilitation degree in 1994 from the University of Orléans (France). He was an Assistant Professor in the University of Orléans (1988–1996), and then, Professor in the University of Tours (France) (1996–2003). From 2003–2010, he was a Professor at the University of Cergy-Pontoise (France), where he led the Department of Computer Science. He is currently the Head of the Doctoral School of Sciences and Engineering, and is a member of the CNRS research laboratory ETIS. His research interests include database theory, information systems, deductive databases, data mining, OLAP and data warehousing.

Trevor Martin is a Professor of Artificial Intelligence at the University of Bristol. Since 2001, he has been funded by BT as a Senior Research Fellow, researching soft computing in intelligent information management including areas such as extraction and integration of semi-structured information, soft concept hierarchies, the semantic web and user modelling. He is a member of the editorial board of *Fuzzy Sets and Systems*, and has served on many conference programme and organising committees. He is a co-organiser of the Uncertain Reasoning for the Semantic Web (URSW) series of workshops, and was active in a W3C group investigating the same topic as well as chairing the IEEE Computational Intelligence Society's Semantic Web Task Force. He has published over 200 papers in refereed conferences, journals and books, and is a Chartered Engineer and member of the BCS and IEEE, as well as serving on the UK EPSRC College.

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During the last decade or two, *pattern recognition* has become a major research topic in computer science. This is so because the notion of 'pattern' is generic and thus, can apply to almost all fields dealing with information processing, among which we cite, not exhaustively, the following: text, time series, image, video, sound, bio informatics, etc.

On the other hand, addressing such a wide range of application domains has been possible thanks to various computational techniques that provide generic methods or algorithms that have to be adapted and somehow ‘customised’ in order to efficiently provide accurate solutions to a particular application. Clearly, citing these techniques is no longer possible without listing hundreds of methods and algorithms, which we want to avoid here!

The aim of this special issue is to illustrate the double diversity (in terms of addressed topics and of methods or algorithms) mentioned above through six articles that have been selected among the best papers presented at the International Conference on Soft Computing and Pattern Recognition (SoCPaR), held in December 2010 in the University of Cergy Pontoise, France. A brief overview of the selected article is given below:

- The first article, entitled ‘Rough mereology classifier vs. simple DNA microarray gene extraction methods’, addresses the issue of gene separation from DNA microarrays, using classification. The proposed method relies on rough set theory. More precisely, a classifier is built up using weights assigned to every test object by the training ones. Moreover, in order to cope with the problem of high number of attributes in microarray analysis, the author proposes and compares two distinct methods for separating decision classes.
- In the second article, entitled ‘Learning of fuzzy spatial relations between handwritten patterns’, the authors address the issue of hand writing recognition. To this end, they describe a way to represent and learn models of spatial relations based on fuzzy image analysis. In this setting, the use of fuzzy mathematical morphology allows to deal with imprecision of positioning and to adapt to varying shapes of handwritten objects.
- In the third article, entitled ‘Iris recognition based on multi-block Gabor features encoding and improved by quality measures’, the authors propose a personal identification method based on a novel approach to iris recognition. This approach considers the variation of features computed in local regions of a Gabor representation, and a quality method to eliminate images having poor quality.
- In the fourth article, entitled ‘Crowd behaviour analysis and anomaly detection by statistical modelling of flow patterns’, the authors aim to detect in a video abnormal behaviour of people in a crowd. To this end, the prototypes of dense flow representations are parameterised by applying mixtures of Gaussian. Then, K-means clustering is employed to initialise the process, and expectation maximisation approach is used to find the maximum likelihood estimators in flow field clouds. Based on these estimators, flow-blocks can be classified as normal or abnormal.
- The fifth article, entitled ‘Automatic blush detection in ‘concealed information’ test using visual stimuli’, addresses an original issue that requires to identify an appropriate region of the face subject to changes in skin coloration and temperature, in case of deception, shame, anxiety and embarrassment. Moreover, in the proposed approach, detection can support head movements and the fact that the individual subject to analysis can wear glasses. Experimental results show that the accuracy of proposed approach is about 67%, which is a quite acceptable rate, given the difficulty of the tackled problem.

- In the sixth article, entitled ‘Recognition of signed expressions using visually-oriented subunits obtained by an immune-based optimisation’, the authors address the issue of automatic recognition of vision-based sign language. The presented approach is based on data-driven extraction of subsequences. The training and recognition phases are performed, using an immune-based algorithm called CLONAG, and using different distances depending on the considered phase. Experiments are reported and show good results, even in the case of the recognition of new words and of sentences.

We would like to thank the authors for their valuable contributions and their work in significantly extending their papers published in the SoCPaR proceedings. Moreover, we are also grateful to Plamen Angelov, Anna Bartkowiak, Sadok Ben Yahia, Richard Jensen, Anne Laurent, Chu-Hsing Lin, Sylvie Philipp-Foliguet, Dilip Pratihari and Michèle Sebag, whose comments have highly contributed in the quality of the selected articles.

We sincerely hope that this issue will contribute in showing that *pattern recognition* has become a mature enough research field allowing the efficient and accurate processing of difficult, but useful and relevant problems.