
Editorial

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1 Introduction

The special issue promotes exchange of opinions between experts working in different areas of the growing field of multi-data processing technologies and their applications in ubiquitous environments.

The main purpose of the special issue on sensor networks, ubiquitous, and trustworthy computing is to bring together the above communities to exchange latest results, to join efforts in solving the common challenges, but also to contrast the developments in the different communities.

The research and development of these systems, that exploit knowledge in the target domain, is at the forefront of modern researches.

This special issue is intended to present applications in ubiquitous environments. Submitted papers are expected to postulate diverse problems, models and solutions for these applications.

2 Papers in this issue

The first paper in this issue, 'A comparative study of fuzzy evolutionary techniques for footprint recognition and performance improvement using wavelet-based fuzzy neural network', by V. Devadoss Ambeth Kumar and M. Ramakrishnan proposes the wavelet-based method which is based on fuzzy neural network. It reflects the different shapes of toe image subjectively and correctively. The test results show noteworthy improvements in recognition rate.

The second paper, 'Vector quantisation-based neuro-wavelet model with cumulative distribution function for efficient image compression', by Arun Vikas Singh and K. Srikanta Murthy presents developing a compression technique that combines the specific features of wavelet transform, RBFNN and vector quantisation using CDF. The distinct way in which the low and high frequency components are handled in this paper, makes it an efficient technique for compression. It has been demonstrated that the RBFNN, along with wavelet, not only yields better peak signal to noise ratio at high compression ratio but also reduces computation time when the mapped image pixels are used in relation to the unmapped image pixels.

The third paper, 'An incremental construction method of a large-scale thesaurus using co-occurrence information', by Kazuhiro Morita, Hiroya Kitagawa, Masao Fuketa and

Jun-ichi Aoe, proposes a clustering algorithm. The Kullback-Leibler divergence is introduced as a similarity measurement in order to judge superordinate and subordinate relations. Besides, the thesaurus tree can be incrementally updated in each node for a minute change such as the addition of unknown words. In order to evaluate the presented method, the thesaurus consisted of about 60,000 words is made by using about 16 million co-occurrence relationships extracted from the Google N-gram. From random data in the thesaurus, it turns out that the proposed method for a large-scale thesaurus achieves high precision of 0.826.

The fourth one, 'Effectiveness of an implementation method for retrieving similar strings by trie structures', by Masao Fuketa, Toshiyuki Tamai, Kazuhiro Morita and Jun-ichi Aoe, suggests a data structure and a fast retrieval algorithm for similar strings by existing tries. Moreover, the retrieval speed for some implementation methods of a trie is compared. From experimental results, the retrieval speed of the proposed method is 2.6–3.5 times faster than that of the conventional method. The retrieval speed of list structures as an implementation method is the fastest.

The fifth paper, 'Template matching algorithm for exudates detection from retinal fundus images', by M. Tamarasi and K. Duraiswamy, provides an automated system for the identification of exudates for early diagnosis of diabetic retinopathy. The grey scale version of colour retinal fundus image was first produced. It was then enhanced using pre-processing techniques. The template matching (TM) algorithm was proposed to segment the exudates regions from diabetic retinopathy retinal images. This was experimented with a dataset, DIARETDB0 which consists of 130 colour retinal fundus images. The sensitivity and specificity achieved are 99.45% and 95.68% respectively. It shows 98.72% accuracy.

The sixth paper, 'A multiple window-based co-location pattern mining approach for various types of spatial data', by M. Venkatesan and Arunkumar Thangavelu, discusses the key challenges using event centric approach and N-most prevalent co-location patterns approach. This paper proposes the window-based model to find the neighbourhood for point spatial data sets and the multiple window model for extended spatial data objects. This paper also uses N-most prevalent co-location patterns approach to filter the number of co-location pattern generation. The

paper proposes more generic and efficient window-based model algorithm to find co-location patterns.

The seventh paper, 'Content-based image retrieval using colour and shape features', by YoungJae Park, KeeHong Park and GyeYoung Kim, proposes an image retrieval method using colour and shape features. This paper suggests the content-based image retrieval (CBIR) method using colour and shape information. The paper use two features: HSI colour information, especially the hue value, and curvature scale space (CSS) shape information. The candidate image is searched from a database that includes the feature information of many images.

The eighth paper, 'Development of vision for IT engineers' required skills by analysis of ITSS applying text mining', by Rasha El-Agamy and Kazuhiko Tsuda, proposes an method for analysing information technology skill standards (ITSS) documents and extracting important information that helps human resources to develop

themselves to be successful IT workers. This research has used text mining techniques to analyse the 35 special fields and has discussed the relation between different special fields. The paper proposes a method that derives the required keywords to move between different fields, using some of text mining techniques.

The last paper, 'Prediction of financial crises using statistic model and intelligent technologies in ubiquitous environments', by Junsuke Senoguchi and Setsuya Kurahashi, explores some key influential factors on the occurrence of the financial crises, using a traditional logistic model and intelligent system technologies. As a result, the cyclical component of the current account as percentages of GDP and the cyclical component of the domestic loan as percentages of GDP have been proved a key factor to predict a financial crisis. In the present, China and Malaysia can be classified as crises group with 77% of possibilities.