
Editorial

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Biographical notes: Faisal Saeed is a Senior Lecturer at the Department of Information Systems, Faculty of Computing, Universiti Teknologi Malaysia (UTM), Malaysia. He received his BSc in Computers (Information Technology) from Cairo University, Egypt, MSc in Information Technology Management and PhD in Computer Science from UTM, Malaysia. His research interests are machine learning, data mining, information retrieval, computational biology, and chemoinformatics.

Information and communications technology (ICT) has totally transformed daily life because of the valuable innovations in this field. This special issue focuses on the main trends that enable ICT to be more innovative and intelligent. It includes the research on artificial intelligence, computer vision, machine learning, etc.

The evolving spiking neural network (ESNN) is used widely in the recent research. The ESNN has several advantages including being a simple, and efficient neural model trained by a fast one-pass learning algorithm. The evolving nature of the model can be updated whenever new data become accessible with no requirement to retrain earlier existing samples. However, the ESNN model is affected by parameter choice and the pre-synaptic neurons determination; the correct selection of parameters and the pre-synaptic neurons allow the network to evolve towards reaching the best structure, thus guaranteeing the best output. For this reason, an optimiser is needed to find the best combination of parameters and the pre-synaptic neurons. In the paper 'An integrated harmony search algorithm-based multi-objective differential evolution of evolving spiking neural network', Saleh et al. proposed an integrated harmony search algorithm based on multi-objective differential evolution of evolving spiking neural network (HSMODE-ESNN) is presented to determine the optimal pre-synaptic neurons (network structure) and accuracy performance for classification problems simultaneously. This proposed method uses the Harmony Search (HS) algorithm in selecting the offspring by using all individuals rather than two in differential evolution (DE). This feature enhances the flexibility of the HS algorithm in producing better solutions which is utilised to overcome the disadvantage of DE.

With the development of multimedia techniques, digital library and multimedia databases, an efficient and effective retrieval system has become a necessity, to search for images based on their contents like colour, texture and shape. There are many issues which affect the images index such as images database used, selection of image features

and dimension of vector feature. Many researchers have focused on extracting visual features from images, particularly if those images have a great historical value, such as paintings or manuscripts. Recently, many initiatives were undertaken by libraries, museums and governmental institutes all over the world with the goal to preserve their rich cultural heritage and make it more accessible to public. In the paper entitled 'Texture and fuzzy colour features to index Roman mosaic-images', Maghrebi et al. presented an efficient approach to index and retrieve Roman mosaic-images by region. The image regions are defined based on the mosaic-image presentation. For more efficiency, the proposed approach uses an index combining texture and fuzzy colour features. These features are fuzzy image dominant colour, fuzzy colour histogram and local Robert gradient binary pattern operator (LRGBP). Similar images are extracted using a fuzzy similarity and histogram intersection measures. The proposed index is tested on database containing 800 images of historical Roman mosaics from first to fourth centuries.

Toon-shading is a type of non-photorealistic rendering techniques developed in order to produce computer graphics output appear to be hand-drawn. It often used to convey the cartoon-style at movies, video games and comic books. The intuitive end result of toon-shading is very simplistic and exaggerative 2D animation. The main feature of toon-shading is the hard edge that separates between the shadowed and illuminated colours on the surface of 3D model. Though toon-shading exploited little number of colours, it has an ability express a great amount of information. Figure 1 illustrates how the toon-shading technique can depict the 3D models. It is obvious that the toon-shading technique employed the shading to convey the light and dark orientations on the surface. In paper entitled 'Interactive toon shading using mesh smoothing', Al-Rousan et al. proposed a method that takes the advantage of the simplified Phong model in the generation of 2D toon-shading from 3D models. Further processing of 3D models is necessary before they can be used as inputs to generate a simplified toon-shading image. The proposed method exploited the smoothing operation to eliminate the extra details of the original 3D geometry, which emphasise the simplicity of the final shading effect.

In data mining, clustering is a method of grouping similar data points together. This grouping can be done using partitioning clustering algorithms or hierarchical clustering algorithms. K-means is one of the partitioning clustering algorithms which are simple and faster than other clustering algorithms. Major drawbacks of K-means algorithm are the selection of initial centroids and the selection of number of clusters (K). In the paper entitled 'A novel method for selecting initial centroids in K-means clustering algorithm', Poomagal et al. providing a solution for selecting initial centroids in which a new point is calculated at each iteration and the data point in the dataset which is the closest to the calculated new point is selected as the centroid. The performance of the proposed work is compared with K-means algorithm and optimised K-means algorithm using four benchmark datasets collected from UCI repository. From the results, it is proved that the proposed work increases accuracy by 88.74% for Iris dataset, 28.18% for Breast cancer dataset, 34.03% for Seeds dataset and 18.18% for PIMA I Diabetes dataset over the other methods.

One of the important applications for document recognition is the bank cheque processing, which is known as cheque literal amount. A few studies focused on Arabic bank cheque processing system compared to other systems, such as Latin and Chinese. The Arabic script has a number of characteristics that makes it unique among other scripts. It is known that humans are the best pattern recognisers. As such, the features detected while human reads the script can get better recognition rates. Therefore,

proposing human reading inspired features (which are called perceptual features) can overcome the unique technical challenges in Arabic literal amount recognition. In the paper entitled ‘Enhanced structural perceptual feature extraction model for Arabic literal amount recognition’, an enhanced structural perceptual feature extraction model (PFM) has been proposed. Two main groups of features, which are the components and dots features and the loops and characters shapes features were combined to construct the PFM. This model was evaluated on standard AHDB dataset. The PFM results outperformed the results reported in the previous studies.