Guest Editorial Preface

Special Issue on Intelligent Computing in Ubiquitous Computing (ICUC)

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The expression intelligent computing (IC) usually refers to the ability of a computer to learn a specific task from data or experimental observation. Even though it is commonly considered a synonym of soft computing, there is still no commonly accepted definition of computational intelligence.

IC is a set of nature-inspired computational methodologies and approaches to address complex real-world problems to which mathematical or traditional modelling can be useless for a few reasons: the processes might be too complex for mathematical reasoning, it might contain some uncertainties during the process, or the process might simply be stochastic in nature. Indeed, many real-life problems cannot be translated into binary language (0 and 1) for computers to process it. Accordingly, IC provides solutions for such problems.

IC uses a combination of five main complementary techniques, the fuzzy logic which enables the computer to understand natural language, artificial neural networks which permits the system to learn experiential data by operating like the biological one, evolutionary computing which is based on the process of natural selection, learning theory, and probabilistic methods which helps dealing with uncertainty imprecision.

Except those main principles, currently popular approaches include biologically inspired algorithms such as swarm intelligence and artificial immune systems, which can be seen as a part of evolutionary computation, image processing, data mining, natural language processing, and artificial intelligence, which tends to be confused with IC.

This special issue offers a remarkable collection of papers covering a wide range of topics in intelligent systems, computing and their real-world applications. Despite computer science's comparatively brief history as a formal academic discipline, it has made a number of fundamental contributions to science and society—in fact, along with electronics, it is a founding science of the current epoch of human history ('the Information Age') and a main driver of the Information Revolution. The goal of AiCIS'18 conference is to provide a platform for researchers to present fundamental contributions, and to be a premier venue for academic and industry practitioners to share new ideas and development experiences.

This special issue of the International Journal of Advanced Pervasive and Ubiquitous Computing (IJAPUC) contains four revised and extended papers from the 1st Annual International Conference on Information and Sciences (AiCIS'18) held in University of Fallujah, Iraq on 20-21 November 2018. This well-established conference series extends the theory and practice of intelligent and computing in converging technological environments. It fulfils the need for stimulating critical debate on and research into theories, approaches, principles, applications and the implementation of intelligent computing.

The four papers in this special issue cover a range of aspects of intelligent computing, from case studies in inquiry-based science learning. Each of these revised and extended papers has undergone full three blind peer review, prior to being selected for this special issue.

The first article proposes a new intelligent algorithm to discriminate Arabic poems by inserting the Arabic poems texts and coding Arabic letters, extracting letters features depending on letters

shapes to construct multidimensional contingency table, and analyses the frequencies of letters in the inserted texts statistically. The proposed coding and discrimination (CODIS) algorithm could be applied for different Arabic texts in any media. A sample of five poems for six poets was examined to implement (CODIS) algorithm. Chi-Square statistic is used to determine the relation between the features and discriminate poems.

While, the second article introduces a comparative study between the performance of two different classification techniques implemented in an automatic classification system for identifying two types of infants' cries, pain, and non-pain. The techniques are namely, Continuous Hidden Markov Models (CHMM) and Artificial Neural Networks (ANN). Two different sets of acoustic features were extracted from the cry samples, those are MFCC and LPCC, the feature vectors generated by each were eventually fed into the classification module for the purpose of training and testing. The results of this work showed that the system based on CDHMM have better performance than that based on ANN. CDHMM gives the best identification rate at 96.1%, which is much higher than 79% of ANN whereby in general the system based on MFCC features performed better than the one that utilizes LPCC features.

The third article illustrates the segmentation techniques based on; classic morphology and fuzzy morphology, and a comparison between them. The proposed methods were tested using the database of mini -MIAS, which contained 322 images. After comparison the statistical results, it shows, the detection of tumor boundary with fuzzy morphology give the higher accuracy than the results in classic morphology. The accuracy is 60.69%, 58.61% respectively due to the high flexibility of foggy logic in dealing with the low lighting in the medical images.

Finally, the last article concentrated on a noise removal technique, followed by improvement contract of medical images for a right diagnosis using balance contrast enhancement technique (BCET). Then, Image segmentation have been used. Finally, the Canny edge detection method is applied to detect the fine edges. The experimental results achieved nearly 98% accuracy in detecting area of the tumor and normal brain regions in MR images demonstrating the effectiveness of the proposed technique.

As the official International Journal of Advanced Pervasive and Ubiquitous Computing (IJAPUC), which is the custodian of the AiCIS'18 conference, IJAPUC is proud to bring you this special issue. We hope that reading these high-quality articles will inspire you to make your own submissions to future AiCIS conference, and to support the intelligent computing research community by becoming a member of AiCIS committees.

Ahead of this international event, UoF administration and board of trustees in addition to AiCIS steering committee and chairmanship would like to extend their innermost appreciation for the international researchers, key-note speakers, academicians and experts who are making this event a successful reality.

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