Editor's Note

The International Journal of Interactive Multimedia and Artificial Intelligence (IJIMAI) covers all types of Artificial Intelligence (AI) research. The effort of reviewers, editors and authors have made the journal's quality to go up every year. Last year, the goal of being included in the Journal Citation Reports index was achieved [1]. It is totally clear to me that the journal could not have grown up that much without all the people that supports the journal. These include the abovementioned editors, reviewers and, specially, the authors, who trust and support the journal with their high-quality work. Let's continue this trail and keep growing in order to make IJIMAI the influential AI journal that it deserves to be.

Last year, a set of very interesting special issues were published in this journal. Some of them are, for instance, the Special Issue on Uses Cases of Artificial Intelligence, Digital Marketing and Neuroscience [2], the Special Issue on Artificial Intelligence Applications [3] or the Special Issue on Big Data and Open Education [4]. This time, for the first issue of the year, we are glad to present a Special Issue on Soft Computing. Soft Computing is an AI branch that focuses on solving problems that have incomplete, inexact or fuzzy information. In other words, Soft Computing area includes algorithms and methods that are typically used when the imprecision or lack of the dealt data make other type of methods to become useless. Deep Learning, Machine learning and Fuzzy Systems related methods have achieved really good results even when the available data is not as good as desired. This success has converted the Soft Computing area in one of the most important ones inside the AI field.

This special issue's goal is to reunite some of the most recent research on the Soft Computing area. The selected research covers different aspects and problems on the AI area in an effort to provide a clear overview of the state of the art on the topic. Concretely, the research included in this issue is described below.

In [5], Borhani and Ghasemloo, provide an innovative model whose purpose is to describe the urban growth. Fuzzy Logic and Artificial Neural Networks are employed by the authors in order to achieve this goal. The paper applied the designed method in a real case: the Tehran's city. Thanks to the proposed method, it is possible to know in advance how a specific city will grow. This will be critical when providing solutions that fit the citizens.

Roopa and Harish propose an interesting soft computing medical application in [6]. They use fuzzy rule networks in order to detect where a thrombus is located. For this purpose, several ECG signals taken from patients are analyzed. By studying previous detected cases, the network is capable of building a classification model that is able to automatically indicate in which artery is the thrombus located. Thanks to this method, the time required for detection is reduced and the patient can be treated in lesser time. It should be noticed that time is a critical issue in patients with thrombus. If the treatment comes late, the patient can end up dying.

Continuing the medical applications of soft computing methodologies, in [7], Devi et al. present a novel method that is capable to automatically detect skin lesions. By using an image detection technique that employs Fuzzy C-Means Clustering, they are capable of detecting the skin lesion area with a segmentation accuracy of 95.69%. This is an interesting soft computing application method that can release skin experts for finding the skin lesions by themselves. The method can do it automatically and they can focus on applying the cure. The time saving in the skin lesion finding task can be employed in assisting more patients.

In [8], Selim et al. propose an interesting application of Soft Computing for energy stability purposes. Concretely, they use fuzzy logic systems in order to detect the most efficient way of distributing energy generators on energy distributions systems. By finding the best place to put generators, it is possible to maximize the voltage stabilization. Authors compare the proposed method with others and find out that the novel developed method that they designed provides really good results.

Continuing on the electronical and electrical Soft Computing application line, Kumar et al. provide a solution to detect faults that occur on a 6-phase transmission line [9]. The developed method can successfully discriminate, classify and locate these elements. Authors have also compared their approach with other ones that already exist in the literature. They found out that their Soft Computing novel designed application provides the most robust solution to the tackled problem.

Another important Soft Computing application is shown on [10] by Wu et al. They study the use of different learning methods for classifying plantar pressure images that lack information. Thanks to this, it is possible to classify the images even when the amount of data information is low. Authors found out that a convolutional neural network provides better results in this problem than the other tested methods.

In [11], Mohammadpoor et al. propose a really interesting application of Soft Computing in the agricultural area. They employ the C-mean Algorithm in order to build a classifier that is able to detect leaves that suffer from a concrete disease: the grape fanleaf virus. Thanks to this method, it is possible to find out in short time which plants have the disease and eradicate it before the whole plantation is infected and all the production is lost. Carrying out this process using a computational system that analyses images is faster than having to carry out this process manually.

Bobadilla et al., in [12], propose the use of neural networks in order to create a recommender system from big databases. Authors propose a novel method that is able to carry out data reduction in order to design a recommender system that is capable of providing efficient solutions. They have tested the developed system with MovieLens and FilmTrust databases. Nevertheless, the proposed method can be applied to any recommender system, since it does not rely on the database topic.

Following with neural networks approaches, Maheshan proposes the use of a convolution neuronal network in order to detect the eyes' sclera [13]. Authors apply this method over the Sclera Segmentation and Recognition Benchmarking Competition (SSRBC 2015) datasets, which comprises of 734 different images. The developed method can help to create a reliable eye recognition system. Biometric applications are becoming one of the most interesting options in security applications. Among all the approaches, iris recognition is one of the most interesting options due to the fact that there are not two humans with the same iris. As authors have stated, Soft Computing can become quite useful in this area.

In [14], Saleem et al. use deep neural networks in order to enhance speeches that are recorded in noisy environments. Thanks to this, authors can effectively remove noise and improve the voice signal. Consequently, it is easier to know what is being said. A deep neural network implementation is used to obtain the required parameters of the ideal binary mask (IBM) classification function. Thanks to the correct use of the parameters, authors demonstrate that the function can effectively retrieve and improve the speech. The developed method is quite useful in cases where the parameters of

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the algorithms are not clear. Therefore, by applying the developed approach the parameters are automatically set, and users do not have to carry out any testing task.

In [15], Hans et al. present novel Binary Multi-Verse Optimization (BMVO) approaches that can be used in feature selection. BMVO methods work resembling the physics' multi-verse theory. Concretely, they imitate the way that several universes interact among them. The main goal of the proposed approach is double. First, authors manage to provide a reliable method for removing irrelevant and redundant data. Thanks to this, the posterior learning method will be more efficient. Second, the presented approach can improve the classification accuracy that BMVO approaches normally have.

Following the bio-inspired optimization line, in [16], authors compare the ant-colony optimization algorithm (ACO) with K-Means Clustering approaches in solving one specific problem: Jobs Scheduling and Energy Optimization Model in Internet of Things (IoT). IoT is present in more and more products. Therefore, there is a need of methods, like the presented one, that is capable of efficiently manage how items work and interact.

In [17], Manju et al, present a multi-layer neural network solution for imbalanced dataset in Internet traffic classification. In order to test the accuracy of the proposed method, authors use the Cambridge dataset which consists of 248 features spread across 10 classes. Their method obtains a 99.08% of accuracy value for this highly imbalanced dataset (standard), which is the main goal of the method.

In [18], Borhani presents a multi-criteria optimization method for calculating flying routes in large-scale airlines. In order to achieve this goal, multi-objective genetic algorithms are applied over flights intelligent spatial information. The proposed method is tested over the Iran airline traffic patterns that were made on 2018. Thanks to the proposed approach, 50.8% of air routes were decreased. Therefore, the presented method is capable of reducing flight time and, consequently, it reduces the planes energy consumption. Thanks to this, the flights companies can gain benefits and the amount of fuel consumed is reduced.

Finally, in [19], Fong et al. present a paper whose main purpose is to aid in the recent coronavirus outbreak. Concretely, they propose a methodology for training forecasting models with small datasets. The method has three main advantages. First, it is capable of augmenting the initial existing data. Second, it includes a panel selection to select the best model. Finally, it tunes the parameters in order to reach the highest possible accuracy. The proposed methodology has been tested over data related to the 2019-nCoV disease outbreak.

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References

[1] E. Verdú and R. González, "Editor's Note", vol. 5, International Journal of Interactive Multimedia and Artificial Intelligence, vol. 5, n. 7, pp. 4-5.

[2] F. Mochón and A. Baldominos, "Editor's Note", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 5, n. 6, pp. 4-5.

[3] F. Mochón, "Editor's Note", International Journal of Interactive Multimedia and Artifical Intelligence, vol. 5, n. 4, pp. 4-5.

[4] D. Burgos, R. Nikolov, C. M. Stracke, "Editor's Note", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 5, n. 2, pp. 4-5.

[5] M. Borhani, and N. Ghasemloo, "Soft Computing Modelling of Urban Evolution: Tehran Metropolis", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 7-15.

[6] C. K. Roopa and B. S. Harish, "Automated ECG Analysis for Localizing Thrombus in Culprit Artery Using Rule Based Information Fuzzy Network", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 16-25.

[7] S. S. Devi, N. H. Singh, and R. H. Laskar, "Fuzzy C-Means Clustering with Histogram based Cluster Selection for Skin Lesion Segmentation using Non-Dermoscopic Images", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 26-31.

[8] A. Selim, S. Kamel, L. S. Nasrat, F. Jurado, "Voltage Stability Assessment of Radial Distribution Systems Including Optimal Allocation of Distributed Generators", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 32-40.

[9] N. A. Kumar, C. Sanjay, and M. Chakravarthy, "Mamdani Fuzzy Expert System Based Directional Relaying Approach for Six-Phase Transmission Line", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 41-50.

[10] Y. Wu, Q. Wu, N. Dey, and R. S. Sherratt, "Learning Models for Semantic Classification of Insufficient Plantar Pressure Images", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n.1, pp. 51-61.

[11] M. Mohammadpoor, M. G. Nooghabi, Z. Ahmedi, "An Intelligent Technique for Grape Fanleaf Virus Detection", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 62-67.

[12] J. Bobadilla, F. Ortega, A. Gutiérrez and S. Alonso, "Classification-based deep neural network architecture for collaborative filtering recommender systems", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 68-77.

[13] M. S. Maheshan, B. S. Harish, and N. Nagadarshan, "A Convolution Neural Network Engine for Sclera Recognition", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 78-83.

[14] N. Saleem and M. I. Khattak, "Deep Neural Networks for Speech Enhancement in Complex-Noisy Environments", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 84-90.

[15] R. Hans, and H. Kaur, "Binary Multi-Verse Optimization (BMVO) Approaches for Feature Selection", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 91-106.

[16] S. Kumar, V. Kumar Solanki, S. Kumar Choudhary, A. Selamat, R. González Crespo, "Comparatively Study on Ant Colony Optimization (ACO) and K-Means Clustering Approaches for Jobs Scheduling and Energy Optimization Model in Internet of Things (IoT)", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 107-116.

[17] N. Manju, B. S. Harish and N. Nagadarshan, "Multilayer Feedforward Neural Network for Internet Traffic Classification", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 117-122.

[18] M. Borhani, "A Multicriteria Optimization for Flight Route Networks in Large-Scale Airlines Using Intelligent Spatial Information", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 123-131.

[19] S.J. Fong, G. Li, N. Dey, R. Gonzalez-Crespo, and E. Herrera-Viedma, "Finding an Accurate Early Forecasting Model from Small Dataset: A Case of 2019-nCoV Novel Coronavirus Outbreak", International Journal of Interactive Multimedia and Artificial Intelligence, vol. 6, n. 1, pp. 132-140.