

# Editor's Note

**T**HE International Journal of Interactive Multimedia and Artificial Intelligence - IJIMAI (ISSN 1989 - 1660) provides an interdisciplinary forum in which scientists and professionals can share their research results and report new advances on Artificial Intelligence (AI) tools or tools that use AI with interactive multimedia techniques. Already indexed in the Science Citation Index Expanded by Clarivate Analytics, within the categories "Computer Science, Artificial Intelligence" and "Computer Science, Interdisciplinary Applications", during the next month the journal will be listed in the 2019 Journal Citation Reports [1]. Again, given this great milestone, the IJIMAI Editorial Board reiterates its appreciation for their support to authors, reviewers and readers.

The present regular issue starts with two articles related to one of the most relevant problems nowadays, which is the COVID-19 pandemic. Over the past years, there have been great advancements in health, but the evidence is that it remains a challenge to deal with pandemics and to achieve global health. IJIMAI has always reserved a space for health topics [2] [3] [4] and in the last years, a Special Issue on Big Data and e-health [5] or a Special Issue on 3D Medicine and Artificial Intelligence [6] were published. As Mochón and Baldominos state [7], "from a global perspective, a clear statement can be made: Artificial Intelligence can have an immense positive impact on societies... AI is turning into a key player at the time of diagnosing diseases at an early stage or developing new medicines and specialized treatment". Being aware of this, a great number of researchers and scientific entities are focusing the efforts in this field and, specifically on the current world pandemic, as the researchers involved in the first two articles of this regular issue.

The first article by Dur-e-Ahmad and Imran [8] proposes the use of a SEIR model to estimate the basic reproduction number  $R_0$ , obtaining an accurate prediction of the pattern of the infected population with data from some of the most affected countries by COVID-19 at the time of the research. An interesting finding is the identification of the most significant parameter values contributing to the estimation of  $R_0$ . The next article, by Saiz and Barandiaran [9], targets to quick detection of COVID-19 in chest X-ray images using deep learning techniques. They use a merged dataset that includes pneumonia images, obtaining a robust method able to distinguish between COVID-19 and pneumonia diseases.

The next work by Shikha, Gitanjali, and Kumar [10] proposes a hybrid content-based image retrieval system (CBIR) to target limitations of those systems based on a single feature extraction, traditional inefficient machine learning approaches or lacking semantic information. They propose a system that extracts color, texture and shape features, uses an extreme learning machine classifier and relevant feedback to capture the high-level semantics of an image. The experiments report that the proposal outperforms other state-of-art related CBIR solutions.

In the field of affecting computing, Huang et al. [11] describe a three-dimensional space model valence-arousal-dominance (VAD) based on the theory of psychological dimensional emotions. Specifically, they study the clustering and evaluation of emotional phrases. The work proposes a VAD based model, develops a rule-based inference system using fuzzy perceptual evaluation, and introduces dimensional affective based VAD clustering called VADdC, taking successfully application on a dataset that has been acquired from an online questionnaire system.

Clustering methods are also used in the next study by Fyad, Barigou,

and Bouamrane [12]. They are applied to the analysis of genes. Their process consists of grouping data (gene profiles) into homogeneous clusters using distance measurements. Although various clustering techniques are applied with this objective, there is no consensus for the best one. Therefore, this paper describes the comparison of seven clustering algorithms against the gene expression datasets of three model plants under salt stress.

The next papers relate to the *Internet of Things* (IoT). This is supported by the Radio Frequency Identification (RFID) technology. RFID networks usually require many tags and readers and computation facilities, having limitations in energy consumption. Thus, for saving energy, networks should operate and be able to recover in an efficient way. The first work by Rathore, Kumar and García-Díaz [13], enlarges the RFID network life span through an energy-efficient cluster-based protocol used together with the Dragonfly algorithm, managing complex networks with reduced energy consumption.

The second paper about the IoT by Balakrishna et al. [14] targets the unification of streaming sensor data generated by the IoT devices and the automatic semantic annotation of the data. They present an Incremental Clustering Driven Automatic Annotation for IoT Streaming Data (IHC-AA-IoTSD) using SPARQL to improve the annotation efficiency. The approach is tested on three health datasets and compared with other state-of-art approaches finding encouraging results.

Next work by Ríos-Aguilar, Sarría and Pardo [15] proposes a mobile information system for class attendance control using Visible Light Communications (VLC). This system allows the automatic clocking in and clocking out of students through their mobile devices, so that lectures do not spend time in attendance management. A proof of concept has been developed, setting up a testbed representing a real world classroom environment for experimentation, showing the viability of the system.

Nowadays, there is a variety of speech processing applications which suffer from background noise distortions. Saleem, Khattak and Verdú [16] present a comprehensive review of different classes of single-channel speech enhancement algorithms in the unsupervised perspective in order to improve the intelligibility and quality of the contaminated speech. A taxonomy based review of the algorithms is presented and the associated studies regarding improving the intelligibility and quality are outlined. Objective experiments have been performed to evaluate the algorithms and various problems that need further research are outlined.

Next paper by Hurtado et al. [17] targets the problem of automatically detecting large homogenous groups of users, which is a very useful task in recommender systems like those focused on e-commerce and marketing. These authors use clustering methods based on hidden factors instead of ratings to make a virtual user that represents the set of users of a group. The approach outperforms the state-of-the-art baselines, specifically improving results when it is applied to very sparse datasets.

Nowadays, there is a search of alternative energy sources due to the lack of conventional ones and the pollution caused. Fuel cells are considered promising sources, specifically the proton exchange membrane fuel cell (PEMFC) can be a suitable solution for various applications. Sultan et al. [18] propose to apply the Tree Growth Algorithm (TGA), an optimization technique, to extract the optimal parameters of different PEMFC stacks. Four case studies of commercial PEMFC stacks under various operating conditions are used to validate

the solution and to compare with other optimization techniques, showing better results for the TGA-based approach.

The following article goes back to the education field, Villagr -Arnedo et al. [19] describe a student's performance prediction system based on support vector machines. The aim is to help teachers diagnose students and select the better moments for teacher intervention. The system exploits the time-dependent nature of student data, producing by weekly predictions which are shown in progression graphs that have the potential for giving early insight into student learning trends.

These days there is a high demand of continuous intelligent monitoring systems for human activity recognition in different contexts. Deep learning techniques arise again in this issue with their application in a new two-stage intelligent framework for detection and recognition of human activity types inside premises. Verma et al. [20] propose this framework to recognize human single-limb and multi-limb activities in real-time using video frames. A Random Forest classifier is used to distinguish input activities into human single-limb and multi-limb. Then, a two 2D Convolution neural network classifier is used to recognize the activities. The experiments done shows a high accuracy in real time recognition of the activity sequences.

This regular issue closes with an article of Garc -a-Holgado, Marcos-Pablos and Garc -a-Pe -alvo [21] which is of interest for the whole scientific community. Although there are different methods for systematic reviews of literature to address a research question, there is no a method to undertake a systematic review of research projects, which are not only based on scientific publications. Therefore, their work provides the guidelines to support systematics reviews of research projects following the method called Systematic Research Projects Review (SRPR). The proposal represents a solid base to define future research projects, providing a method to identify the gaps in previous research projects, to identify the results of other projects that can be reused, and to prove the innovation of the new projects.

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