Editor's Note

Artificial Intelligence (AI) represents one of the fastest growing areas of knowledge, sectors and fields of action globally. This growth has allowed to mark different positions, where the most favorable ones are oriented to its unquestionable contribution to facilitate decision making in various fields of society, as well as other sectors that mark a strong position for its use to be carried out in a regulated and measured way due to the scope and risks to which we are exposed. For this reason, rigorous methods are increasingly required for the design and development of AI-based computational models; methods that involve strict mechanisms for their validation, as well as the analysis of possible risks and scope that they may have on the field of application where they are being exposed. This type of aspects would definitely mark a valuable and relevant milestone to define several paths within which we can find two: 1) if it is definitely necessary to set limits on the use of AI by establishing increasingly sophisticated regulatory frameworks on various areas involving data protection and regulated use of the same, and 2) to remove all barriers so that it can be exploited openly in all its dimensions in any area of our society. Hence the importance of analysing the different risks and threats that AI may present within the particular context in which it is being applied.

Based on this panorama, this regular edition of the "International Journal Interactive Multimedia and Artificial Intelligence" presents a series of papers where proposals are oriented to different fields and sectors, which make use of diverse approaches, methods, models and AI-based systems that allow us to have a generalized idea of how these challenges are being addressed in some fields of our society. In particular, this regular issue collects research topics focusing on addressing the problems of evolving recommender systems, classification models, decision support systems, system modelling, data analytics, optimization algorithms, image retrieval, deep neural networks, social network analysis, and the relevance of the design of User Experience (UX) proposals. In order to provide a brief description of all the proposals and contributions, following is a summary of the 23 articles present in this regular issue.

In the field of health, in the proposal entitled "Exploring ChatGPT's Potential for Consultation, Recommendations and Report Diagnosis: Gastric Cancer and Gastroscopy Reports' Case", authors aim to explore ChatGPT tool as a potential tool in disseminating gastric cancer knowledge, providing consultation recommendations, and interpreting endoscopy reports. Through experimentation, authors found that GPT-4 model of ChatGPT achieved an appropriateness of 91.3% and a consistency of 95.7% in a gastric cancer knowledge test.

For its part, in the paper entitled "A Hybrid Parallel Classification Model for the Diagnosis of Chronic Kidney Disease", authors propose a fast and novel hybrid approach to diagnose Chronic Renal Disease. The proposed approach is based on the optimization of SVM classifier with the hybridized dimensionality reduction approach to identify the most informative parameters for CKD diagnosis.

Within the same subject, in the paper entitled "HDDSS: An Enhanced Heart Disease Decision Support System Using RFE-ABGNB Algorithm", authors suggest a heart disease decision-support system (HDDSS) that can predict whether or not a person has heart disease. The main goal of this research work is to use the RFEABGNB algorithm to improve HDDSS prediction accuracy.

In the same line of health and medical fields, the research entitled "ResNet18 Supported Inspection of Tuberculosis in Chest Radiographs with Integrated Deep, LBP, and DWT Features" proposes a TB detection framework using integrated optimal deep and handcrafted features in order to detect tuberculosis in chest radiography. To carry out this research, authors proposed a series of stages that include: (i) X-ray collection and processing, (ii) Pretrained Deep-Learning (PDL) scheme-based feature mining, (iii) Feature extraction with Local Binary Pattern (LBP) and Discrete Wavelet Transform (DWT), (iv) Feature optimization with Firefly-Algorithm, (v) Feature ranking and serial concatenation, and (vi) Classification by means of a 5-fold cross confirmation.

The article entitled "RGBeat: A Recoloring Algorithm for Deutan and Protan Dichromats", authors present a contribution associated with an algorithm that enhances the color perception of deutan and protan dichromats but without compromising the lifelong color perceptual learning. According to the researchers, this is the first HTML5-compliant web recoloring approach for dichromat people that considers both text and image recoloring in an integrated manner.

In the proposal entitled "Validity and Intra Rater Reliability of a New Device for Tongue Force Measurement", authors present a method to validate a new device proving that it is accurate compared to the algometer, more specific the study is oriented to determine the intra-rater reliability of a protocol to assess the maximum tongue force in asymptomatic subjects. For instance, authors propose a prototype device specifically for this study to measure tongue force through force-sensitive resistor sensors.

In the same field, in the article entitled "Deep Learning Assisted Medical Insurance Data Analytics With Multimedia System", authors present a convolution neural network-based deep learning infrastructure that performs medical imaging data analysis in various pipeline stages, including data-loading, data-augmentation, network architectures, loss functions, and evaluation metrics. The proposed deep learning approach supports both 2D as well as 3D medical image analysis. Finally, authors evaluate the proposed system's performance using metrics like sensitivity, specificity, accuracy, and precision over the clinical data with and without augmentation.

Changing to the area of optimization, in the work entitled "A Comparative Evaluation of Bayesian Networks Structure Learning Using Falcon Optimization Algorithm", authors present and evaluate a Bayesian network structure learning trough Falcon Optimization Algorithm (FOA) in order to suggest the best structural solution to create the FOA. The FOA algorithm is based on the falcon's searching technique during drought conditions. The suggested technique is compared to the score metric function of Pigeon Inspired search algorithm, Greedy Search, and Antlion optimization search algorithm. The performance of these techniques in terms of confusion matrices was further evaluated by the authors using a variety of benchmark data sets.

There are several proposals in optimization as the one in the paper entitled "Multi-Agent and Fuzzy Inference-Based Framework for Traffic Light Optimization", where the authors present a traffic simulation framework based on agent technology and fuzzy logic. The objective of this framework is to act on the phase layouts represented by its sequences and length to maximize throughput and fluidize traffic at an isolated intersection and for the whole multi-intersection network, through both inter- and intra-intersection collaboration and coordination. The system profits from agent communication and collaboration as well as coordination features, along with decentralized organization, to decompose the traffic control optimization into subproblems and enable the distributed resolution. Authors also use fuzzy technology to handle the uncertainty of traffic conditions.

DOI: 10.9781/ijimai.2023.05.005

In the field of image recognition, in the paper entitled "Digit Recognition Using Composite Features With Decision Tree Strategy", authors propose a method to identify all the characters of E13B using feature recognition in order to reduce the use of magnetic ink reader as specialized and expensive method in the baking industry. Hence authors found that the proposed method of recognition used, has relevant correlations to prove its validity and accuracy. The proposed method was also applied to an embedded device to ensure that the CPU would be used for verification instead of a high-end GPU.

For its part, in the paper entitled "Cosine Similarity Based Hierarchical Skeleton and Cross Indexing for Large Scale Image Retrieval Using Mapreduce Framework", the authors present a new method for image retrieval, named Cosine Similarity-based hierarchical skeleton and cross-indexing, that is proposed to perform the retrieval process in the MapReduce framework effectively. The feature vector of the images is converted to binary sequences. The Most Significant Bit (MSB) of the binary code is used to store the images in the mapper using the cross-indexing model.

Changing the area, in another article entitled "A Greedy Randomized Adaptive Search With Probabilistic Learning for Solving the Uncapacitated Plant Cycle Location Problem", the authors propose a mathematical formulation to model the Uncapacitated Plant Cycle Location Problem, specifically, trough the location-routing problem aimed at determining a subset of locations to set up plants dedicated to serving customers.

In the paper entitled "Resource and Process Management With a Decision Model Based on Fuzzy Logic", the authors propose a new aggregation operator in order to solve the problem of the allocation of the resources to be shared in the context of a distributed processing system that needs to be coordinated through the mutual exclusion mechanism.

In the field of cloud platforms, in the article entitled "A Hybrid Secure Cloud Platform Maintenance Based on Improved Attribute-Based Encryption Strategies", the authors introduce a hybrid data security scheme called the Improved Attribute-Based Encryption Scheme (IABES). This IABES combines two powerful data security algorithms: Advanced Encryption Standard (AES) and Attribute-Based Encryption (ABE) algorithm. These two algorithms are combined to provide massive support to the proposed approach of data maintenance over the remote cloud server with high-end security norms. This hybrid data security algorithm assures that the data cannot be attacked over the server by the attacker or intruder in any case because of its robustness.

For its part, in the paper entitled "Real World Anomalous Scene Detection and Classification Using Multilayer Deep Neural Networks", a novel methodology termed Bag of Focus (BoF) based training methodology has been proposed. BoF is based on the concept of selecting motion-intensive blocks in a long video, for training different deep neural networks (DNN's). The authors found that the methodology reduced the computational overhead by 90% (ten times) in comparison to when full-length videos are entertained.

In the field of Machine Learning Algorithms, in the paper entitled "RIADA: A Machine-Learning Based Infrastructure for Recognising the Emotions of *Spotify* Songs", authors present the RIADA infrastructure which is composed by a set of systems able to annotate emotionally the catalog of songs offered by Spotify based on the users' perception. RIADA works with the Spotify playlist miner and data services to build emotion recognition models through the use of Machine learning algorithms, music information retrieval techniques, architectures for parallelization of applications and cloud computing.

Based on a computational model, in the research entitled "Rhetorical Pattern Finding", authors research about rhetorical patterns from a musicological and computational standpoint. The above through a theoretical examination of what constitutes a rhetorical pattern is conducted. This examination includes primary sources and the study of the main composers, a formal definition of rhetorical patterns is proposed. Among the rhetorical figures, a set of imitative rhetorical figures is selected for the study, namely, epizeuxis, palilogy, synonymy, and polyptoton. Authors design a computational model of the selected rhetorical patterns to automatically find those patterns in a corpus consisting of masses by Renaissance composer Tomás Luis de Victoria.

Changing to the field of education, in the article entitled "Mapping the Situation of Educational Technologies in the Spanish University System Using Social Network Analysis and Visualization", the authors present two different maps based on the data from ICT Sectorial of CRUE Universidades Españolas. Together, they illustrate the penetration of different types of EdTech in Spain´s universities system and shed light on the strategic interest behind their adoption. The main goal of the authors for this study, is to produce self-explanatory maps that can be easily and directly interpreted.

In other side, in the field of recommender systems, in the paper "Local Model-Agnostic Explanations for Black-box Recommender Systems Using Interaction Graphs and Link Prediction Techniques", the authors propose a local model-agnostic, explanation-by-example method for recommender systems based on knowledge graphs to leverage this knowledge requirement. The system only requires information about the interactions between users and items. Through the proper transformation of these knowledge graphs into item-based and user-based structures, link prediction techniques are applied to find similarities between the nodes and to identify explanatory items for the user's recommendation.

In the field of the semantic web, in the article entitled "OntoInfoG++: A Knowledge Fusion Semantic Approach for Infographics Recommendation", the authors propose the OntoInfoG++, which is a knowledge centric recommendation approach for Infographics that encompasses the amalgamation of metadata derived from multiple heterogeneous sources and the crowd sourced ontologies to recommend infographics based on the topic of interest of the user. The approach models user topic of interest from the Query Words, Current User-Clicks, and from standard Knowledge Stores like the BibSonomy, DBpedia, Wikidata, LOD Cloud, and crowd sourced Ontologies.

Switching topics, in the field of the development of mobile applications, in the paper entitled "Adaptation of Applications to Compare Development Frameworks in Deep Learning for Decentralized Android Applications", the authors present the results of the analysis and a comparison of deep learning development frameworks, which can be adapted into fully decentralized Android apps from a cloud server.

In the field of User Experience (UX), in the paper entitled "On the Importance of UX Quality Aspects for Different Product Categories", the authors conceptualize UX as a set of semantically distinct quality aspects in order to present several studies that investigate this dependency between the product category and the importance of several well-known UX aspects.

Finally, in the same field of User Experience (UX), in the article entitled "Development of a Shared UX Vision Based on UX Factors Ascertained Through Attribution", the authors present an approach to developing a shared UX vision. This UX vision was developed by the product team while a collaborative session. The results show that the present approach for developing a UX vision helps to promote a shared understanding of the intended UX in a quickly and simply way.

Dr. Paulo Alonso Gaona-García
Universidad Distrital Francisco José de Caldas