

## Editorial

Each paper in this issue of the journal has been evaluated during peer reviewing process selecting those that the editorial committee finally considered ready for publication. In my opinion, the papers in this issue have excellent quality and it is my pleasure to present them to journal reader.

"A Semantically based Lattice Approach for Assessing Patterns in Text Mining Tasks" is the invited paper by John Atkinson, Alejandro Figueroa and Claudio Perez (Chile). They present a new approach for automatically assessing patterns in text mining that combines corpus based on semantics and formal analysis of concepts in order to deal with both semantic and structural properties. The approach was applied in generations of association rules. Experiments showed that it assesses effectively discovered patterns as compared with similar methods.

In their paper "An Efficient use of Pivots for Approximate Search in Metric Spaces", Raisa Socorro Llanes and María Luisa Micó André (Cuba, Spain) focus on pivot for fast nearest neighbor search algorithms, working in any metric space reducing the time consumed during searches. This approximation reduces number of the distances that should be computed. The results for real and artificial databases confirm consistent improvement in performance.

In their paper "On the NP-Completeness of Computing the Commonality amongst the Objects upon which a Collection of Agents has performed an Action" Roberto Alonso and Raul Monroy (Mexico) prove NP-completeness of a problem that queries the commonality amongst the object collection involved by agents while executing an action. The NP-completeness is proved as a Karp reduction problem.

The paper "Model counting in the  $2\mu$ -3MON Syntactic Class" by Carlos Guillen, Rafael Lemuz, and Irene Ayaquica (Mexico) discusses if the counting model problem in Boolean formulas

is NP-complete. It presents a syntactical treatable family class  $2\mu$ -3MON. The identification is based on hyper-graph associated with simple structures, such as chains and cycles. In this case, matrix operators allow counting in a linear time.

The paper "A New Measure of Circularity Based on Distribution of the Radius" by Ana M. Herrera Navarro, Hugo Jimenez Hernandez, Hayde Peregrina Barreto, Federico Manriquez Guerrero, and Ivan R. Terol Villalobos (Mexico) considers that the traditional border measures are highly dependent on image resolution and sensitive shape variations and propose a new circularity measure. This measure takes into consideration the object probability distribution in the dominant geometry. Therefore, the invariant property contours or shape resolution are smooth. The comparison with three other measures is presented: factor shape, mean roundness and radius ratio, observing that the proposed measure has advantages for quantifying the circularity.

Antonio Alarcon Paredes, Oleksiy Pogrebnyak and Amadeo Arguelles Cruz (Mexico) in the paper "Image Transform based on Alpha-Beta Associative Memories" propose a new method of application of Alpha-Beta Associative Memories for Images that generate Alpha-Beta Heteroassociative Memories on each sub-block of gray scale using a given transformation matrix. In this way, the Inverse Alpha-Beta Transform obtains the original image through the recovered patterns. The proposed model focuses on image transformation as compared with Morphological Transform based on the Morphological Associative Memories. The entropy in Shannon sense is smaller for the proposed model as calculated for the original image. Additionally, the proposed method provides faster processing with a small number of elementary operations such as addition, subtraction, maximum and minimum.

Erik Cuevas and Noe Ortega Sanchez (Mexico) in the paper "Harmony Search Algorithm and its Use in Digital Image Processing" describe an optimization method for analysis of images with noise problems. Application of the Harmony Search (HS) algorithm to digital image processing is a meta-heuristic optimization inspired by musicians improvising new harmonies while performing. This technique was applied in two examples: circle detection and motion estimation, both viewed as an optimization problem. The circle detection uses a combination of three edge points as parameters constructing candidate circles. A matching function determines if such candidate circles are actually present in the given image. In motion estimation, the HS algorithm is used for finding a vector motion minimization. The sum of the absolute differences between two consecutive images presents an approximated solution.

In the paper "On Efficiency of Detection of Subpixel Targets with Hypothesis Dependent Structured Background Power" by Victor Golikov, Olga Lebedeva, Manuel May Alarcon, Francisco Mendez Martinez, Marco Rodriguez Blanco, and Mayolo Salvador Islas Chuc (Mexico) Matched Detector and Matched Sub-space Detectors under the null and the alternative hypotheses are described. The two statistic test distributions are derived under these conditions, and it is analytically shown that these detectors could suffer a drastic degradation in performance power under the alternative hypothesis. The differences between the performance with respect to structured and unstructured backgrounds are considered. The theoretical results are compared with simulated data. Experimental results for small floating object detection on an agitated sea surface using the spectral digital video validate the theoretical simulation.

The paper "Ontology-Driven Semantic Comparison between Geographic Data Sets" by Rodrigo Cadena Martinez, Rolando Quintero Tellez, Marco Antonio Moreno Ibarra, Miguel Torres Ruiz, and Giovanni Guzman Lugo (Mexico) presents the methodology for Comparison and Assessment of Geographic Datasets (CAGD) with a semantic approach

considering the conceptual representations using ontology. The paper is focusing on the semantic approaches. The interpretation and representation stages are analyzed for two study cases.

Rosa Maria Valdovinos Rosas, Rosalinda Abad Sanchez, Roberto Alejo Eleuterio, Edgar Herrera Arteaga and Adrian Trueba Espinosa (Mexico) in the paper "Handling the Multi-Class Imbalance Problem using ECOC" (Error-Correcting Output Codes) propose a strategy for handling imbalance class problems for data sets with multiple classes integrating a mixture of experts, whose members are trained as a part of the general problem and, in this way, improve the behavior of the whole system. The problem is analyzed by employing the ECOC method. Each class is codified in pairs, which are considered for training the experts. Experiments with real datasets demonstrate the viability of the proposed strategy.

The work "Three D-Modeling of the Mexican Sign Language for a Speech-to-Sign Language System" by Santiago Omar Caballero Morales and Felipe Trujillo Romero (Mexico) presents a Speech-to-Sign Language System. Deaf people use Sign Language (SL) communication. A translation system (Speech/Text-to-SL) was developed to assist communication for deaf people with high efficiency. However, SL is applied across countries and cultures with different vocabularies and signs. In Mexico, the work in this field is very limited. The authors present a new approach creating a Mexican Speech-to-SL system, integrating a 3D MSL model with a multi-user Automatic Speech Recognizer (ASR) with dynamic adaptation.

The work "Analog Processing based on Quasi-Infinite Resistors" by Carlos Muniz-Montero, Luis Abraham Sanchez Gaspariano, Victor Hugo Ponce Ponce, Maria Elena Aguilar Jauregui, and Osvaldo Espinosa Sosa (Mexico) presents a new technique based on high-value (quasi-infinite) resistors for CMOS analog integrated circuits such as offset compensated amplifiers, low-frequency filters, programmable current mirrors, and membership function generators. The proposed technique incorporates transistors operating in weak inversion mode, reducing the area requirements

and minimizing the Direct Current (DC) offset. In addition, improvement on both noise performance and linearity was achieved along with an enhanced speed-accuracy-power tradeoff. The presented circuits are attractive for implementation of high-accuracy processors like neural networks, adaptive filters, and neural-fuzzy systems.

In the paper “A New Service based on an Approach for Enterprise Modeling” by Hugo Estrada, Alicia Martinez, Luis C. Santillan, and Joaquin Perez (Mexico) services for enterprise modelling are analyzed. Many modeling techniques capture different business semantic perspectives: transactional, goal-oriented, aspect-oriented, and value-oriented, among others, having a natural input software generation process. However, none of the current modelling proposals take into account the business organizations nature service. It was the first task that the authors consider in the paper. This approach represents an organizational model as a business services composition. Business services are the basic building blocks encapsulated into a set of business process models. In these, the actors build a network dependent on interfaces in business service description

The report on PhD thesis “Generative Manifold Learning for the Exploration of Partially Labeled Data” by Raul Cruz Barbosa and Alfredo Vellido (Spain) deals with the manifold learning model, namely Generative Topographic Mapping (GTM). The model is capable of representing data of convoluted geometries. The resulting Geodesic GTM (Geo-GTM) model shows continuity and trustworthiness representation with robust behavior in the presence of noise.

We hope that the readers of the journal “Computación y sistemas” will appreciate these interesting high quality papers.

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