

Editorial

Dear readers, it's my great pleasure to present you this new issue of the "Computación y Sistemas". You might find some interesting papers with potential applications to resolve some practical problems such as determining highway tolls, object searching, nature language processing, the classification problem and so on. In particular, it is exciting and inspiring to announce two papers are made contribution to quantum computation and quantum information in this issue.

José Luis González Velarde *et al.* (Mexico). This paper "A Scatter Search Algorithm for Solving a Bilevel Optimization Model for Determining Highway Tolls" presents the problem of determining optimal tolls established on a subset of arcs in a multicommodity capacitated transportation. A methodology is proposed to solve this Bilevel Optimization problem by using optimization software at the lower level and the metaheuristic Scatter Search at the upper level.

Guillermo De Ita Luna *et al.* (Mexico). This paper "Finding Pure Nash Equilibrium for the Resource-Constrained Project Scheduling Problem" focuses on how to solve the Resource Constrained Project Scheduling (RCPS) problem with a method in terms of non-cooperative intelligent agents. They analyze the global joint interaction of scheduling via a congestion network and seek to achieve stable assignments of scheduling and show each state of the neighborhood represents an instance of the RCPS problem. To this end, they apply a novel greedy heuristic with a polynomial time complexity and similar to the well-known heuristic NEH.

Judith Espinoza *et al.* (Mexico). This paper "Saving Time for Object Finding with a Mobile Manipulator Robot in 3D Environment" addresses the problem of reducing the time to find an object. Two main strategies are proposed: (1) to coordinate the motion of robot's degrees of freedom optimizing only those most relevant for the task, and (2) to repair a previously computed plan whenever the environment changes locally. All the algorithms have been implemented and the simulation results in realistic environments are presented.

Hector J. Selley-Rojas *et al.* (Mexico). Their paper "Randomized Algorithm based on Sliding Distributions for the Scheduling Problem in Grid Systems" presents a randomized algorithm for the online version of the Job Shop problem where jobs are composed of processes with precedence constraints and processors are organized in a Grid topology. This is based on a new technique denominated as sliding distributions to combine the advantages of the deterministic approximation algorithms with those of the Monte Carlo randomized algorithms. The temporal complexity of the proposed algorithm is found correct, and the performance is evaluated by means of a series of simulation-based experiments.

Roberto Sepúlveda *et al.* (Mexico). Their work "Classification of Encephalographic Signals using Artificial Neural Networks" proposes two models of artificial neural network architectures with the perceptron multilayer and an adaptive neuro fuzzy inference system for the signal classification of eye blinking and muscular pain in the right arm caused by an external agent. Both models use supervised learning. The ocular and electroencephalographic time-series of 15 people between 23 and 25 ages are used to generate a data base. Experimental results in the time and frequency domain of 50 tests applied to each model show that both neural network architecture proposals for classification produce successful results.

Junior Altamiranda *et al.* (Venezuela). Their paper "Pattern Recognition System Based on Data Mining for Analysis of Chemical Substances in Brain" presents a data mining system for analyzing biochemical changes in the brain of rodents, in which system consists of several steps (pre-processing, data classification, etc.). Some of steps utilize the artificial neural network based on the adaptive resonance theory. In experiment, glutamate and aspartate neurotransmitters in samples extracted from rodent brains were analyzed.

Yumilka B. Fernández (Cuba). This paper "An Approach for Prototype Generation based on Similarity Relations for Problems of Classification" proposes a new method for solving classification

problems based on prototypes. When using similarity relations for granulation of a universe, similarity classes are generated, and a prototype is constructed for each similarity class. Experimental results show that the proposed method has higher classification accuracy and a satisfactory reduction coefficient compared to other well-known methods, proving to be statistically superior in terms of classification's precision.

Asma Moubaidin et al. (Jordan). Their paper "Arabic Dialogue System for Hotel Reservation based on Natural Language Processing Techniques" presents an Arabic dialogue system intended to interact with hotel customers and to generate responses about reserving a hotel room and other services. The system uses text-based natural language dialogue to navigate customers to the desired answers. They report an experiment with 500 volunteers unfamiliar with the system in a real environment. The results confirm the viability of using an Arabic dialogue system to tackle the problem of interactive Arabic dialogues.

Mireya Tovar et al. (Mexico). Their paper "Evaluation of Ontological Relations in Corpora of Restricted Domain" proposes a new approach for automatic evaluation of relations in ontologies of restricted domain. In particular, they use various lexico-syntactic patterns with the aim to evaluate the class-inclusion and ontological relations that the ontology holds. The approach focuses on a reference corpus for finding evidence of the relation validity and it's capable to provide an accuracy measure for each ontology evaluated, a value associated in some way with the quality of the ontology relations.

Damny Magdaleno et al. (Cuba). This paper "Clustering XML Documents Using Structure and Content based on a New Similarity Function Overall Sim SUX" proposes a new method of automatic clustering of XML documents based on their content and structure and a new similarity function Overall Sim SUX which facilitates capturing the degree of similarity among documents. The experiments with data sets showed better results than those in previous work.

Santiago Matalonga et al. (Uruguay). Their paper "AGIS: Towards an ISO9001 based Tool for Measuring Agility" presents an assessment tool to measure agility based on ISO 9001:2008 process

improvement principles, which can be used to measure a degree of agility aligned with the agile manifesto values. Its goal is to provide an objective measurement of agility that avoids false positives on both sides.

Manuel Ávila et al. (Mexico). Their paper "Times of Execution of the Quantum NOT Gate Operating on One of Two Interacting Qubits" proves that for a system of two interacting qubits through a XXZ Hamiltonian which is maximally entangled, it is impossible to execute a quantum NOT gate operating on one of them, where the interaction between two qubits means presence of noise inside one of them.

Arturo Arvizu-Mondragón et al. (Mexico). This paper "FPGA-Based Emulation of a Synchronous Phase-Coded Quantum Cryptography System" presents FPGA-based emulation of a synchronous phase-coded quantum cryptography system. They only use one base of the QPSK system to get a simpler modulation (BPSK) scheme. The reported results from the emulation and the experiment in terms of Quantum Bit Error Rate (QBER) and mutual information for different values of the number of photons per bit are in good agreement.

Julio César Tovar Rodríguez et al. (Mexico). This paper "Disturbance Rejection Using SPR0 Substitutions" reports the disturbance rejection, defined as the problem of designing control laws that ensure, where possible, exogenous disturbances that do not affect the output of the perturbed system, has been resolved by means of algebraic and geometric techniques. Modifications of the Smith form through the SPR0 substitutions are presented to guarantee infinite zeros of a linear single input, single output (SISO) system.

This issue would be helpful for the colleagues who are interested in those recent advances in computation science, particularly in Computational Intelligence, Natural Language Processing, Human Language Technologies, Control and Quantum Computation.

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