

# Editorial

**A**RTIFICIAL INTELLIGENCE is ubiquitous nowadays. It penetrates in the areas of science and computing that have been traditionally considered very far from heuristic methods—from networking and hardware design to economy, biology, medicine, forensics, etc. It is perhaps difficult to think of an area of modern computing that would not heavily depend on intelligent methods, or of an area of modern science or technology that would not greatly benefit from applications of Artificial Intelligence.

In Mexico there exists a large and rapidly growing community of researchers and students working in this area. The Mexican Society of Artificial Intelligence (SMIA; [www.SMIA.org](http://www.SMIA.org)) consists of more than two hundreds computer scientists and interdisciplinary researchers. The SMIA devotes great effort to dissemination of both relevant scientific results and the general knowledge about Artificial Intelligence and its potential to solve practical problems.

The main forums organized by the SMIA for discussion and exchange of scientific ideas are the Mexican International Conference on Artificial Intelligence (MICAI, [www.MICAI.org](http://www.MICAI.org)), which receives two to five hundred submissions every year from thirty to forty countries all over the world, and the Mexican Conference on Artificial Intelligence (COMIA), oriented to Mexican students, where the talks are given in Spanish.

The journal *Komputer Sapiens* ([www.komputersapiens.org](http://www.komputersapiens.org)), another flagship product of the SMIA, is devoted to bringing knowledge about Artificial Intelligence and the practical applications and solutions that it offers, to general public, from students to businesspersons and decision makers, in simple and understandable terms, yet with in-depth exposition and thoughtful discussion.

It is my pleasure to present to the readers this issue of *Polibits*, with more than half of its papers devoted to various areas of Artificial Intelligence.

The issue offers to the reader eleven papers written by authors from eight countries: Cuba, Czech Republic, India, Italy, Mexico, Spain, Tunisia, and Vietnam.

The first six papers give a representative selection of topics that comprise Artificial Intelligence: optimization algorithms, neural networks, robotics, and natural language processing.

Gonzalo Nápoles, Isel Grau, and Rafael Bello (Cuba) in the paper “Constricted Particle Swarm Optimization based Algorithm for Global Optimization” discuss a modification of the Particle Swarm Optimization (PSO), which is a bio-inspired algorithm oriented on solution of complex problems. The modification presented in this paper helps the algorithm to

explore the whole search space in order to find the global optimum, instead of being trapped in a local optimum.

Beatriz A. Garro, Humberto Sossa, and Roberto A. Vazquez (Mexico) in the paper “Automatic Design of Artificial Neural Networks by means of Differential Evolution” suggest an automatic method for designing optimal neural network—which is an activity that so far has been more an art than a science, heavily dependent on the trial-and-error approaches. Specifically, they use the method of Differential Evolution.

Jaroslav Moravec (Czech Republic) in his paper “Map Building of Unknown Environment Using L1-norm, Point-to-Point Metric and Evolutionary Computation” shows yet another application of the method of Differential Evolution, in this case to the task of automatically building maps of previously unknown environment for orientation of a robot, which is currently a tedious, time-consuming, and error-prone task.

Eduardo Cendejas, Grettel Barceló, Gigori Sidorov, Alexander Gelbukh, and Liliana Chanona-Hernández (Mexico) in the paper “Aligned Word Networks as a Resource for Extraction of Lexical Translation Equivalents, and their Application to the Text Alignment Task” study the potential of multilingual semantic dictionaries known as WordNets, or word networks, for tasks useful for machine translation, in particular, for word-level alignment of parallel bilingual texts.

Laroussi Merhben, Anis Zouaghi, and Mounir Zrigui (Tunisia) in the paper “Lexical Disambiguation of Arabic Language: An Experimental Study” continue the discussion of multilingualism and semantic issues in natural language processing. They analyze a number of well-known supervised learning algorithms for word sense disambiguation and test them on Arabic language data.

Anup Kumar Kolya, Asif Ekbal, and Sivaji Bandyopadhyay (India) present a third paper devoted to natural language processing: “A Hybrid Approach for Event Extraction”. Event extraction consists in identifying in natural language texts mentions of event that occurred at some specific time mentioned in the text, and extracting their characteristics, such as time of occurrence. They show that a combination of different machine learning approaches gives the best results on this task.

E. Lebano-Perez, C. A. Gracios-Marin, J. F. Guerrero-Castellanos and G. A. Munoz-Hernandez (Mexico) in their paper “Graphical Description of Soft Fault on Manufacturing Systems Using FDI Strategy: a SCL Approach” show the benefits of a graphical design tool to model failures in manufacturing process involving robotic instruments. A number of screenshots they included in the paper gives a rich feeling of the system they have developed.

Marva Angélica Mora Lumbreras, Álvaro Jair Martínez Varela, Julio Cesar Calva Plata, Rubén Alfredo Mejorada Lira, Brian Manuel González Contreras, and Alberto Portilla (Mexico) with the paper “VirtUATx: A Virtual Reality and Visualization Center” continue the topic of visual tools. They present a virtual reality and visualization center that they have developed for the Autonomous University of Tlaxcala.

Tran Khanh Dang and Tuan Anh Truong (Vietnam and Italy) in the paper “Anonymizing but Deteriorating Location Databases” address an important privacy and security issue: preventing malicious data miners or attackers from extracting sensitive personal information from very large databases that contain personal data of citizens or users. The authors test their approach on real-world databases.

Fernando Rodríguez-Haro, Felix Freitag, and Leandro Navarro (Spain and Mexico) in the paper “A QoS App-SLO Manager for Virtualized Infrastructure” present a formal specification of high-level component for an enhanced hypervisor in cloud computing, which allows implementing a Quality of Service policy in the virtual machine.

Finally, Marco Antonio Acevedo Mosqueda, Emmanuel Martínez Zavala, María Elena Acevedo Mosqueda, and Oleksiy Pogrebnyak (Mexico) conclude the volume with the paper “A Novel Method of Beamforming to Improve the Space Diversity”, in which they show how to improve the space diversity of an antenna array, thus reusing frequency of transmission and improving throughput of radio communication channel.

I am grateful to the Editorial Board of Polibits for the great opportunity for me to serve as a guest editor of the journal, and I would like to congratulate both the authors and the readers with yet another successful issue of this excellent journal.

*Dr. Raúl Monroy*

President, Mexican Society  
of Artificial Intelligence (SMIA);  
Professor, Tecnológico de Monterrey

Guest Editor