

# Editorial

**M**ANY readers have noticed that Polibits is now indexed in the **DBLP** computer science bibliography, the most important and most widely used international indexing service in the area of computer science. This is a seal of high international recognition of the quality of a journal and impact of the papers published in it. For us, European computer scientists, Polibits, along with another excellent Mexican journal called *Computación y Sistemas*, represents the best and brightest of Mexican computer science and, more generally, the best and brightest of Latin American computer science.

Starting from this issue, the journal uses electronic **ISSN** different from its print ISSN, and **DOI** references are assigned to all papers and indicated in both the printed and electronic versions. While the journal has been published electronically and with open access since 2008 and now provides electronic open access to its back issues dating many years back, now the electronic version is recognized via a separate ISSN and assignment of DOIs. Yet another achievement of the journal is its inclusion in the **Redalyc** index.

This issue of the journal Polibits includes ten papers by authors from 12 different countries: Argentina, Brazil, Chile, Colombia, Ecuador, France, Mexico, Morocco, Panama, Spain, Turkey, and USA. The papers included in this issue are devoted to such topics as computer security, computer vision, database technologies, city traffic modeling, robotics, optimization, software technology, soft computing, and natural language processing.

**M. A. Garcia and T. Trinh** from **USA** in their paper “Detecting Simulated Attacks in Computer Networks Using Resilient Propagation Artificial Neural Networks” describe the use of resilient propagation neural networks in the field of computer security. They train the neural network to recognize simulated attacks, for which there is complete information available that permits evaluation of the performance of the suggested approach and compare it with existing approaches. The authors demonstrate that this kind of neural network is a promising mechanism for detecting intrusion in large computer networks.

**F. Dornaika** et al. from **Spain, Morocco, and France** in their paper “Object Classification using Hybrid Holistic Descriptors: Application to Building Detection in Aerial Orthophotos” present a framework for detection of objects in images, based on the use of hybrid image descriptors. Specifically, they show the advantages of their method on the task of detection of buildings in aerial images. The advantages of the proposed method include its better applicability, suitability, and simplicity, as well as better performance. A

hybrid descriptor combines color histograms with a number of local binary patterns. Such descriptors, applied to regions of a segmented image, permit to use supervised machine learning methods for classification that results in detection of the objects of the desired type, building roofs in the case study performed by the authors.

**B. Velázquez Ordoñez** et al. from **Mexico** in their paper “Integración de fuentes heterogéneas de datos textuales” (“Integration of Heterogeneous Textual Data Sources”) show how to improve the results of combining data from different databases. The problem arises because when heterogeneous data from different databases are combined, the merging process can generate inconsistencies, the schema can lack entities to store information of the corresponding kind, different databases may use different languages for data representation or different measures for the values, etc. The authors’ approach is based on object-oriented model, which facilitates class extension and reuse.

**C. S. G. Pires** et al. from **Brazil** in their paper “Mobile ACORoute—Route Recommendation Based on Communication by Pheromones” address the problem of congestion in urban transportation in large cities. Existing major attempts at solution include intelligent transportation systems, and route recommendation systems, based on artificial intelligence techniques. The authors have developed a route recommendation system based on the principles of artificial ant colony optimization, namely, on the pheromone-based communication, combined with A\* technique. Their system is capable of real-time modeling of traffic situation, including dynamics of cars and passengers. The system is being implemented in the form of an Android application that will help the users to avoid areas with heavy traffic.

**L. Barba and N. Rodríguez** from **Ecuador and Chile** in their paper “Traffic Accidents Forecasting using Singular Value Decomposition and an Autoregressive Neural Network Based on PSO” continue the topic of city traffic problems, in this case, traffic accidents. Their case study is the city of Concepción, Chile. They apply artificial intelligence methods for forecasting of the number of traffic accidents in this city. The technique include four main phases: embedding of the input time series using the Hankel matrix, decomposition with the singular value decomposition method, estimation using an autoregressive neural network based on particle swarm optimization, and, finally, recomposition. The proposed strategy shows accuracy superior to that of the existing forecasting techniques.

**M. G. Villarreal-Cervantes** et al. from **Mexico** in their paper “Influence of the Binomial Crossover in the DE Variants

Based on the Robot Design with Optimum Mechanical Energy” discuss the problems that arise in the choice of the binominal crossover parameter for differential evolution. The choice of this parameter depends on the specific problem, and it is difficult to formulate general recommendation for it. Accordingly, the authors investigate the effect of the choice of this parameter in their case study, which is the design of a parallel robot. The goal of this design is to minimize the energy consumed by the robot. The authors show that a correct choice of the crossover parameter improves the energy-related characteristics of the robot.

**L. André and R. Stubs Parpinelli** from **Brazil** in their paper “The Multiple Knapsack Problem Approached by a Binary Differential Evolution Algorithm with Adaptive Parameters” continue with the topic of optimization techniques based on differential evolution, in this case an adaptive binary differential evolution. They apply this technique to the solution of the 0-1 multiple knapsack problem, which is an NP-hard optimization problem. The authors compare their solution with a number of conventional optimization techniques, such as conventional (not adaptive) binary differential evolution, genetic algorithms, adaptive genetic algorithms, island-inspired genetic algorithm, and adaptive island-inspired genetic algorithm. The proposed technique shows results better than those of the conventional techniques.

**A. Castro-Hernández** et al. from **USA, Turkey, and Panama** in their paper “Classification of Group Potency Levels of Software Development Student Teams” research into the area of human factors in software engineering. The authors collected various collaboration measures from software development teams in USA, Turkey, and Panama. They used these measures to predict how successful a group that shows particular characteristics can be. They show that simplistic methods are not suitable for the task; however, advanced machine-learning methods allow for good prediction accuracy. Analysis of the factors that correlate with a group’s success will be useful to both leaders of the groups and managers at software development companies.

**S. Jimenez** et al. from **Colombia and Mexico** in their paper “Soft cardinality in Semantic Text Processing: Experience of the SemEval International Competitions” analyze the success

factors of the application of soft cardinality measure, which they have developed in their previous work, in semantic text processing. Soft cardinality is a very promising novel general measure of the “size”, or diversity, of a set, i.e., the “number” of different elements in the set, which, unlike conventional cardinality, can be non-integer if some of the elements are similar: a set can contain “one and a half” different elements if they are half-similar. This definition of the “size” of sets results in a more accurate idea of intersection or union of sets in a great number of tasks of different nature where things can be partially similar. In particular, with this technique the authors obtained good results during several years at the main international competition on semantic text processing, SemEval. The paper analyzes in detail what properties of the soft cardinality technique defined its success.

**M. G. Armentano** et al. from **Argentina** in their paper “Applying the Technology Acceptance Model to Evaluation of Recommender Systems” continue with the topic of human factors in software development. When evaluating recommender systems, most researchers concentrate on technical measures such as accuracy of recommendations. However, the impact of a recommender system depends not only on the technical quality of the results but also on its acceptance by the users. The user acceptance may depend on factors of a completely different nature, such as attractiveness of the user interface. A novel technique used by the authors for analysis of the factors of user acceptance includes self-assessment of the user’s skills. The study shows that perceived ease of use of the system depends to a large degree on the skill level of the users.

This issue of the journal will be useful to researchers, students, and practitioners working in the corresponding areas, as well as to general public interested in advances in computer science, computer engineering, and artificial intelligence.

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