

Editorial

AN EXCELLENT news that I am very happy to share with our readers is the inclusion of our journal in the ISI Web of Science, as part of its SciELO collection. This opens new international horizons to our journal, both in terms of readership, which, with the great visibility of the journal through the most authoritative scientific information platform in the world will now be more numerous and more international, and in terms of the excellence of the published materials, since the journal is now more than even attractive for international authors. No doubt, in the coming years we will witness growth of quality and reputation of our journal.

This achievement is the result of a great work of the new editorial team, which has renewed the image of the journal starting from 2008 and is constantly working on its improvement. I would like to congratulate our associate editors, reviewers, and most importantly, our authors and readers with this new achievement and thank them for their constant effort devoted to the journal. Very special thanks go to Antonio Sánchez Pereyra and his team from the Latin American Bibliography department of the UNAM and SciELO Mexico for their constant support and great help in our editorial work.

This issue of the journal *Polibits* includes ten papers by authors from nine different countries: Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Switzerland, USA, and Vietnam. The papers included in this issue are devoted to such topics as computer vision, machine learning, bioinformatics, natural language processing, computer-assisted learning, databases, computer security, logic, optimization, and scheduling.

C. L. Sabharwal and **J. L. Leopold** from **USA** in their paper “A Completeness of Metrics for Topological Relations in 3D Qualitative Spatial Reasoning” propose novel metrics for qualitative spatial reasoning. Reasoning about locations of objects, such as whether they touch each other or intersect, to which direction one object is located with respect to another, how far the two objects are from each other, etc., has important application in a number of areas, ranging from robotics, computer vision, and geoprocessing (think Google Maps) to natural language generation, when it comes to a natural language description of a scene or, say, driving directions (think again Google Maps). While previous works concentrated on object on a plane, the authors present their metrics for the objects in the three-dimensional space.

R. Z. Nunes Marques et al. from **Brazil** in their paper “EMiner: A Tool for Selecting Classification Algorithms and Optimal Parameters” describe their system that helps in selecting machine learning algorithms and their parameters. While there is a wide range of machine learning techniques,

selecting the right one for a particular task remains an art very difficult to master; in fact this is the very reason for the existence of so many different techniques for more or less the same task: there is no one-size-fits-all methods. What is more, many of these techniques have parameters that should be set by the user—while users often have little clue of how to choose them. A system capable of automatically make such decision will be of great help for the users of machine learning algorithms.

F. Rinaldi et al. from **Switzerland** and **Mexico** in their paper “An Approach towards Semi-automated Biomedical Literature Curation and Enrichment for a Major Biological Database” explain how natural language processing technology can be used for creation biological knowledge bases. The amount of published literature on biological processes and properties of living organisms by far exceeds any human ability for information processing, and keeps growing. To be able to orient in this ocean of information, the researchers are in need of structured, ordered, well-organized knowledge bases semi-automatically learnt from this huge body of published literature. One of such efforts is RegulonDB, a large biomedical knowledge base. The authors’ current effort is devoted to semi-automatic enrichment of this knowledge base.

C. Peñuela et al. from **Colombia** in their paper “Warnings and Recommendation System for an E-Learning Platform” introduce a system for timely alerting students of possible learning problems and signs of poor academic performance and recommending them learning material with which they can improve their learning trajectory. The system relies on a set of existing user profiles and on the observation of the online behavior of the given student to detect deviation from the expected trajectory and early signs of failure. It is especially valuable that the student is not only capable of alerting the student but also of recommending necessary measure to improve the alarming situation.

N. Rodriguez and **L. Barba** from **Chile** and **Ecuador** in their paper “Bi-variate Wavelet Autoregressive Model for Multi-step-ahead Forecasting of Fish Catches” consider a task of time series forecasting; specifically, forecasting of fishery outcome. They apply Fourier spectrum analysis to the time series in question to separate high-frequency component, responsible for short-term predictions, from the low-frequency component that can be used to predict the long-term average behavior of the signal. While it is common to just discard the high-frequency component, the authors build a bi-variant model that uses both component for more accurate forecasting.

T. K. Dang and **C. N. Ngo** from **Vietnam** in their paper “Location Privacy-Aware Nearest-Neighbor Query with

Complex Cloaked Regions” address the problem of protecting users’ privacy in the world of proliferation of ubiquitous Internet-connected location-aware portable devices. A common technique related to this problem is to handle the location of the user in communication with external services not as a point but as a region that is still meaningful for the service (such as “in such city” or “in such supermarket”) but does not pose too high security risk. While previous works consider mainly rectangular regions, the authors deal with complexly-shaped regions: a city or a supermarket are not rectangles.

R. Flores-Carapia et al. from **Mexico** in their paper “Cipher Image Damage: An Application of Filters” present a technique for restoring encrypted images after the data have been damaged, which can be, for example, the result of an attack on the computer system, of hardware failure, or of communication problems. The paper combines image processing technique with cryptographic techniques. The images considered by the authors range from photos of human faces to dense small-print text. The authors also propose statistical and information-theoretic tests to measure the quality of the image restoration process.

E. Zurek et al. from **Colombia** in their paper “An Implementation of Propositional Logic Resolution Applying a Novel Specific Algebra” propose a novel approach to the problem of satisfiability of a logical formula, which is one of fundamental problems of automatic reasoning. For this, the authors develop a logical algebra that allows them to use the resolution-refutation technique to refute or prove satisfiability of the formula.

R. de Abreu Batista and **A. L. Cetertich Bazzan** from **Brazil** in their paper “Identification of Central Points in Road Networks using Betweenness Centrality Combined with

Traffic Demand” address a practical problem of traffic control in a large city. They solve an important task of identifying central points in the road network, which are highly susceptible to bottleneck and jam problems. They apply their technique to analysis of traffic networks of two Brazilian cities, Porto Alegre and Sioux Falls. Their research has implication for urban design, optimization of traffic-related services, and control of traffic in large cities, thus reducing the costs, time spent by people in the traffic jams, as well as risks of traffic accidents.

V. Yannibelli and **A. Amandi** from **Argentina** in their paper “Project Scheduling: A Memetic Algorithm with Diversity-Adaptive Components that Optimizes the Effectiveness of Human Resources” introduce a technique that relies on a memetic algorithm for optimization of the use of human resources. Human resources is one of the most important, and most costly, components of the functioning of companies and organizations; thus, the optimization of their use can result in large cost savings for a company. While a large number of techniques have been proposed for this purpose, the authors’ results significantly outperform the current state of the art on all six test problems considered in this paper.

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, artificial intelligence, and computer engineering.

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