Editorial

IT is my great pleasure to present to the readers the jubilee, 50th issue of the journal Polibits. It was a long journey to go, from a local, institutional journal founded 25 years ago to an internationally recognized journal with both readers and authors from all over the world. This is a result of hard work of many people. Most importantly, this is thanks to our authors, who contributed excellent papers during the 25-year history of the journal.

My congratulations and warmest gratitude go to the editorial team, the Editorial Board, and all reviewers who contributed their knowledge, talent, and time to the hard work of reviewing, with the only reward for their unselfish labor of love being the honor to contribute to the advance of human knowledge. I want to congratulate very gratefully past Editors in Chief of the journal who laid the foundation to its current success, and most of all Prof. Grigori Sidorov, the previous Editor-in-Chief, under whose guidance and thanks to whose constant work the journal flourished as never before.

I also want to thank and to congratulate the authorities of the Centro de Innovación y Desarrollo Tecnológico en Cómputo of the Instituto Politécnico Nacional, our hosting organization that provides all the support and help to the journal. Finally yet importantly, the success of the journal is thanks to the constant and significant support from CONACYT, Mexican Ministry of Science.

This issue of Polibits includes ten papers by authors from thirteen different countries: Belgium, Brazil, Chile, Colombia, Ecuador, France, Italy, Mexico, the Netherlands, Peru, Russia, Sweden, and USA. The papers included in this issue are devoted to such topics as computer vision and video coding, scheduling, robotics, and control, neural networks, databases, and analysis of the web.

H. Brahmasury Jain and K.R. Rao from the **USA** in their paper *Fast Intra Mode Decision in High Efficiency Video Coding* propose a fast predicting algorithm for video encoding, which allows to improve the speed and resolution and to decrease complexity of encoding video for storage and transmission. They give a detailed comparison of several relevant algorithms. K. R. Rao, IEEE fellow, is a co-author of the discrete cosine transform, which has revolutionized image processing and, in particular, is the basis for the JPEG image encoding.

D. G. S. Santos et al. from **Brazil** in their paper *A Dynamic Gesture Recognition System based on CIPBR Algorithm* address a problem at the crossroad of computer vision and human-computer interaction. The authors classify video clips that represent images of human hand movements (palm and fingers) and recognize the type of hand moving gesture basing on adequate feature extraction and supervised machine learning.

A. Moran Cardenas et al. from **Peru**, **Colombia**, and **Sweden** in their paper *Design of High Accuracy Tracking Systems with H_∞ Preview Control* consider a specific type of automatic positioning and tracking control system, which is an important component of autonomous robots. In the paper the authors present a novel method for designing positioning and tracking systems based on so-called H_∞ preview control mechanism.

N. Eloe et al. from **USA** in their paper *A More Efficient Representation of Obscuration for VRCC-3D+ Relations* address yet another problem of high importance for computer vision and robotics: representation and reconstruction of three-dimensional scene basing on the observable two-dimensional image. With this paper, the authors continue their research on spatial knowledge representation, part of which has been published in a past issue of Polibits; the next part will also be published in a forthcoming issue of Polibits.

G. Sidorov et al. from **Mexico** and **Russia** in their paper *Modelo computacional del diálogo basado en reglas aplicado a un robot guía móvil* (*Computational Model of Dialog Based on Rules Applied to a Robotic Mobile Guide*) continue the topic of robotic applications and human-computer interaction. They present a formal model for a dialog between a visitor to a museum, exhibition, university, of another similar space and a mobile robot that serves as a guide for this space. At a verbal request of the visitor, the robot can show him or her places of his or her interest and can also give information about objects or places and answer relevant questions, in a way similar to how a human museum guide would do it.

A. Maccioni et al. from **Italy**, **Belgium**, the **Netherlands**, and **France** in their paper *NoXperanto: Crowdsourced Polyglot Persistence* present an approach to solve very complex database queries in an unusual way: by mining a huge amount of queries produced by human expert users and database administrators. In this way the computer not only processes the formal data to which it has access but instead orchestrates a complex interplay and collaboration between distributed human knowledge and formal computation and involves humans into a global infrastructure of data processing.

N. Rodriguez et al. from **Chile** and **Ecuador** in their paper *Haar Wavelet Neural Network for Multi-step-ahead Anchovy Catches Forecasting* develop a novel multi-step-ahead model for forecasting fish-catch. This is in important problem for the economy of countries that heavily depend on fishing industry either for internal consumption or for export. The model that the authors present is based on a specific type of neural

network, and thus is not specific for fishery; I think this model can be successfully applied to other tasks of forecasting, possibly in financial or in seismic settings.

O. Durán A. et al. from **Chile** in their paper *A Comparison between Two Metaheuristics Applied to the Cell Formation Problem with Alternative Routings* consider a manufacturing scheduling task: there are a number of "machines" that can "process" a flow of products in different order and in different configuration. The task is to optimize the workload on those "machines" to achieve the best utilization of the available processing power for fastest processing of the products. The authors provide a design of a genetic algorithm for such an optimization.

J. A. Castán et al. from **Mexico** in their paper *Control de tráfico basado en agentes inteligentes* (*Traffic control based on intelligent agents*) continue the topic of optimization of processing flow. In this case, the authors address the task of optimal regulation of traffic lights in such a way to avoid congestion and large waiting time for cars. The authors use a cognitive approach based on collaboration of artificial intelligent agents. The authors present a tool for simulating traffic situation and studying the impact of different policies of traffic light control. This work has a potential to improve the quality of life of millions of people who currently spend hours every day in traffic jams.

E. Zurek et al. from **Colombia** in their paper *Acoustic Fingerprint Recognition Using Artificial Neural Networks* apply neural network technology to recognizing marine vessels by audible signal. This is a task important both for civil navigation and, more importantly, for military operations and defense. While most of the authors of this paper are electrical engineers, one of the authors is an NCO Chief of Colombian navy. The practical importance of the task is especially high for Colombia, a country whose military and navy is at the front of heroic combat against organized crime, protecting both its own citizen and all of us from illegal drug trade—much of which passes by sea. Currently, the task of identification of marine vessels is performed by human experts. The use of artificial neural networks allows for a significant increase in its precision.

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 and engineering.

Alexander Gelbukh
Editor in Chief