Editorial

ALTHOUGH the Artificial Intelligence area is almost as old as Computer Science it is a continuous source of large amounts of new developments, and it is still growing since new related fields are emerging and quickly consolidating, making AI stronger every passing day. As a consequence there is an intense amount of excellent works coming out from laboratories deserving to be known by a wider and diverse specialized audience. With this information in mind, and as a modest collaboration to the expansion of AI, *Polibits* has selected a set of important papers reporting works which are published in this issue. The selected works, besides showing the large variety of new developments and potential applications, reflect the diversity of traditional and emergent AI fields which are in constant production of new valuable findings. A brief description of each of these works is given next to illustrate the contents to be found in them.

In the article entitled "*LG-PACKAGE: New Frontier*", Boris Stilman and collaborators report the development of LG-PACKAGE, which is a set of the Linguistic Geometry (LG) tools. In the paper it is stated that LG is a type of game theory that generates best strategies for all sides in a conflict in real time. It also describes the main advanced features of LG-PACKAGE, converting LG-PACKAGE into software of industrial strength applicable to a wide scope of defense systems. The authors also state that US and British defense agencies and the world major defense contractors utilize these tools.

David Sundgren presents "*Expected Utility from Multinomial Second-order Probability Distributions*", in which establishes that computing the expected utility of a decision alternative it may not always be possible to give precise values for the utilities and probabilities of the possible outcomes. As a possible solution the author considers the problem of maximizing expected utility when utilities and probabilities are given by discrete probability distributions so that expected utility is a discrete stochastic variable. He also suggests that a decision rule that reflects the uncertainty present in distribution-based probabilities and utilities- In the article an example of this rule in action is shown with multinomial second-order distributions. And it is demonstrated that discrete second-order probability distributions allow for updating through observations in a way that continuous distributions would not.

A new content-based method for the evaluation of text summarization systems without human model summaries which is used to produce system rankings is shown in "*Summary Evaluation with and without References*" by Juan-Manuel Torres-Moreno *et al*. There they apply a comparison framework to various well-established content-based evaluation measures in text summarization such as COVERAGE, RESPONSIVENESS, PYRAMIDS and ROUGE studying their associations in various text summarization tasks including generic multi-document summarization in English and French, focus-based multi-document summarization in English and generic single-document summarization in French and Spanish.

In "*Creation and Usage of Project Ontology in Development of Software Intensive Systems*", P. Sosnin shows that the key problem of successful developing of software intensive systems (SIS) is adequate conceptual interactions of designers in the early stages of designing. And that the success of the development can be increased with the use of a project ontology the creation of which is being embedded into the processes of the conceptual solving of the project tasks and specifying the project solutions. The author states that the essence of the conceptual design is a specification of conceptualization, and claims that the main suggestion of this article is the creation of the project ontology in the form of a specialized SIS which supports the conceptual activity of designers.

In his paper "*The Role of Automation in Instruction*" Joseph M. Scandura demonstrates the benefits of application of computers in e-learning and presents a novel conceptual scheme of this application.

A description of some important ideas of how to understand and extract the mental representation of individuals in the decision making and planning of trips, related to daily travels is given in the paper entitled "*A Revision and Experience using Cognitive Mapping and Knowledge Engineering in Travel Behavior Sciences*" by Maikel León and collaborators. The reason given is that this is useful information that can be used in transport demand prediction, analysis and studies.

In the paper entitled "*Mixing Theory of Retroviruses and Genetic Algorithm to Build a New Nature-Inspired Meta-Heuristic for Real-Parameter Function Optimization Problems*", Renato Simões, Otávio Noura Teixeira, and Roberto C. Limão describe the development of a new hybrid meta-heuristic for optimization based on a viral lifecycle, focusing in the retroviruses, called Retroviral Iterative Genetic Algorithm (RIGA). This algorithm uses Genetics Algorithms (GA) structures with features of retroviral replication, providing a great genetic diversity, confirmed by better results achieved by RIGA comparing with GA applied to some Real-Valued Benchmarking Functions.

To complement the selected set, in "*Swarm Filtering Procedure and Application to MRI Mammography*" Horia Mihail Teodorescu and David J. Malan investigate the use of biologically-inspired swarm methods for signal filtering. It is

stated that the signal is modeled by the trajectory of an agent playing the role of the prey for a swarm of hunting agents. The swarm hunting the prey is the system performing the signal processing. The movement of the center of mass of the swarm represents the filtered signal. The position of the center of mass of the swarm during the virtual hunt is reverted into grayscale values and represents the output signal. They also show some results of applying the swarm-based signal processing method to MRI mammographs.

The paper of Marvin Arias "*Analysis of Multipath Propagation based on Cluster Channel Modelling Approach*" is an interesting application of AI techniques in the telecommunication field.

The paper "*Formalization of Basic Semiotic Notions in Set Theoretic Terms*" by Alisa Zhila introduces a reader in the complex world of semiotic concepts and presents a formal model of basic notions of semiotics using notions of logic.

With the publication of the chosen papers the editor of this issue of *Polibits* is sure that its reading will bring some new and different insights in several AI research fields as to suit all kinds of scientific preferences in the area. I hope the reader will enjoy and benefit from the presented papers.

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