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Foreword

The domain of artificial intelligence (AI) evolved from its traditional form of theoretical investigations and small, toy size, examples to practical research on the large-scale and real-world tasks. To solve these tasks efficiently, the AI tools must be combined with methodologies of other domains of computer sciences, this development leading to the notion of Intelligent Information Systems (IIS). Such a view perfectly agrees with John McCarthy's (2007) understanding of AI, who treats the domain as "the science and engineering of making intelligent machines".

This special issue on Intelligent Information Systems is devoted to current hot issues of theoretical and applied AI. Surely, current IIS cover a very broad spectrum of computer systems, ranging from decision support systems, through elaborated robot manipulating systems, and ending with systems devoted to understanding natural language, or systems simulating living creatures, their behavior and their interrelationships (Russell and Norvig, 2009). To narrow down this broad spectrum we decided to focus on three disciplines: biologically inspired methods, natural language processing and expert systems.

Let us now briefly summarize the contents of each paper from this special issue. As mentioned above, the issue starts with papers, which deal with biologically inspired methods and techniques.

The paper *Evolving ensembles of linear classifiers by means of clonal selection algorithm*, by Michał Bereta and Tadeusz Burczyński, applies the technologies of artificial immune systems to the problem of supervised learning.

Urszula Boryczka investigates in her paper, *Ant colony metaphor in a new clustering algorithm*, the usability of ant colony algorithms in the task of unsupervised learning, i.e. in clustering of objects.

In the last paper in this group, Krzysztof Trojanowski applies multi-swarms to the problem of dynamic optimization. Again, the swarms are equipped with learning capabilities and some memorizing mechanism. Details are presented in his paper on *Multi-swarm that learns*.

The second group of papers is devoted to handling of information present in text documents. They belong to the field of text mining, understood as the process of deriving high-quality information from text.

Krzysztof Ciesielski, Dariusz Czerski, Michał Dramiński, Mieczysław A. Kłopotek and Sławomir T. Wierzchoń elaborate in their paper *Semantic information within the BEATCA framework* on how semantic information can be exploited in large-scale search engines, especially via biologically inspired clustering methods.

Bartosz Broda, Maciej Piasecki and Stan Szpakowicz go deep into text analysis, presenting in *Extraction of Polish noun senses from large corpora by means of clustering* new methods of disambiguating word sense based on document clustering for a particular natural language.

Finally, Petr Homola and Vladislav Kuboň propose in the paper *A method of hybrid MT for related languages* a novel hybrid approach to machine translation within closely related languages, particularly from the Czech (the source language) to such target languages as Slovak, Russian and Slovenian.

While artificial intelligence had its first successes with expert system applications, they remain still an active field of research.

Wojciech Froelich and Alicja Wakulicz-Deja propose in the paper *Medical diagnosis support by the application of associational cognitive maps* an approach to medical diagnosis with the use of a model of a patient's health expressed in terms of so-called cognitive map.

Angelina A. Tzacheva extends in her paper *Algorithm for generalization of action rules to summaries* previous research on identification of those parts of expert knowledge or knowledge learned from data that may be actually exploited in business activity.

A more theoretical study, but of significant practical implications is the research on missing value treatment in rough set based systems, presented by Jerzy W. Grzymala-Busse, Witold J. Grzymala-Busse, Zdzisław S. Hippe and Wojciech Rząsa.

Finally, the last paper in the issue, *Selection of prototypes with the EkP system*, by Karol Grudziński, places itself somewhere in the field of lazy learning: the author seeks new methods of data editing (i.e. data reduction) via selection of prototypes.

We hope that this selection of research results in the domain of intelligent information systems will be helpful and inspiring for the Readers' own investigations.

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