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SPECIAL ISSUE: GUEST EDITORIAL

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This special issue of Kybernetika collects extended and revised versions of the best papers from Znalosti 2003 ("Knowledge 2003"), second in the series of Czecho Slovak annual conferences on knowledge technologies (`http://www.cs.vsb.cz/znalosti`). The conference was hosted by the VŠB Technical University of Ostrava, on February 19 21, 2003.

The scope of the eight included papers is fairly heterogeneous but representative for the current research on knowledge technologies, in particular knowledge discovery, modelling and management. All of them can be characterised as application-oriented. From a high-level view, shared focus of the first five papers is on *learning* knowledge from (various forms of) *data* by means of inductive (probabilistic, first-order or algebraic) techniques. The sixth and seventh paper describe the principles of successful software applications, which exploit (linguistic or conceptual) *knowledge bases* built in advance. The last paper does not concern knowledge technologies in the narrow sense, but describes a sophisticated indexing method for *document retrieval*, which is an indispensable part of most knowledge management applications.

Novovičová and Malík present a method of probabilistic text classification, where target classes are viewed as mixtures of unknown subclasses (hypothetical topics); the problem of missing conditional probabilities for subclasses is solved using the EM algorithm. Classification accuracy gain over traditional methods is demonstrated on standard datasets. Vomlel proposes a framework for building decision strategies based on Bayesian networks, and applies it on the problem of adaptive testing. To prune the potentially large search space, an admissible heuristic function is suggested. Vojtáš et al. deal with a special variant of inductive logic programming (ILP) where the distinction of positive and negative examples as well as the truth-value of background knowledge are fuzzy. They translate the problem into multiple uses of classical ILP that are later glued together. Železný examines the problem of propositionalisation of relational data for inductive learning, i. e. their conversion to a single table on which attribute-value learners can be applied. In his approach, generation of new features from conjunctions of background predicates is interleaved with their evaluation on data. Vondrák et al. use formal concept analysis as means to evaluate the quality of an organisational structure and to suggest its re-design.

Svoboda and Popelínský describe a question-answering system for the Czech language, which exploits a variety of natural-language-processing techniques. Staníček and Procházka present an efficient knowledge management tool based on a conceptual model with five key concepts: object, connection, operation, category and rule. Finally, Krátký et al. introduce a method for multidimensional term indexing that supports querying not only by simple terms but also by regular expressions. The method has been tested on a large benchmark document collection.

We firmly hope that publication of this special issue will contribute to the process of bringing the state-of-the-art knowledge technology closer to the traditional research streams such as cybernetics. We would like to express our thanks to all authors of the contributed papers for their collaborative attitude, to all referees for their arduous work, and also to the members of the Programme Committee of *Znalosti*, who helped us with the selection of candidate papers based on results of the conference review process.

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