

Dominik Ryżko, Henryk Rybiński, Piotr Gawrysiak, and Marzena Kryszkiewicz

Emerging Intelligent Technologies in Industry

Studies in Computational Intelligence, Volume 369

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Preface

This book presents valuable contributions devoted to applications of emerging, intelligent technologies in different branches of industry. It was prepared with financial support of Samsung Electronics Poland and SAS Institute, the official sponsors of the ISMIS2011 conference.

Among gathered papers several topics have been covered ranging from new algorithms to architectures and tools with applications in various business sectors. All articles were chosen based on rigorous reviews. Some of the papers presented here have been originally submitted to the main track of the ISMIS2011 conference. For their application character, after positive reviews the papers have been accepted for presentation at the Industrial Session, and in the extended version are presented here.

The first chapter presents various techniques of Artificial Intelligence for industrial applications. It contains 5 sections. In the first section Gora describes a genetic algorithm approach to optimization of vehicular traffic in cities, by means of configuring traffic lights. Kursa et al. apply several machine learning methods to understand the interaction process between peptides and immunoglobuline protein. Ferraretti et al. propose a novel interpretation method for petroleum reservoirs based on the integration of unsupervised and supervised learning techniques. Kavousifard and Samet tackle the problem of accurate power load demand prediction with the use of modified shuffled frog leaping algorithm and artificial neural network. Koochakzadeh et al. take on the social network approach in order to address the problem of stock investment decision making.

Chapter 2 contains 5 sections. It is devoted to modern intelligent tools for software engineering are presented. Kołaczkowski and Rybiński present an implementation of an advanced interactive tool for automatic index selection in Relational Database Management Systems. Maluf et al. describe a system for the transfer of technology, developed at NASA. An application of agent technologies for virtual reality is presented by Querrec. In the work by Wysota, porting graphical user interfaces through ontology alignment is introduced. Chabane, Hantry and Hacid present a model checking based approach for querying and splitting techniques in Service-Based Application (SBA). Draszawka and Szymański provide validation measures for nested documents clustering.

Chapter 3 concentrates on NLP tools and their applications in intelligent systems. Wróblewska presents preliminary study on Polish-English word alignment. Means for improving topic models using conceptual data is presented by Musat et al. Szostek and Jaszuk introduce automatic supply of a medical knowledge base using linguistic methods. The section prepared by Karwiński is in the

area of automated language analysis systems, and it proposes an approach to “dynamic” syntax model for increasing efficiency of full-text search systems.

Chapter 4 is devoted to data mining tools for advanced applications. In particular, Kłopotek and Lindsey present an algorithm for parallel tree-shaped bayesian network construction. In the next section, an approach to mining hierarchical communities from complex networks using distance-based similarity is introduced by Li and Yang. In the work by Jarka and Podraza an architecture of distributed system for challenging data mining tasks is proposed. Then Podraza and Żukowski describe an analysis of data frames in order to discover knowledge trends. The section by Małyszko and Stepaniuk presents an application of correlated gauss distribution based rough entropy thresholding measures in the task of image segmentation. A lazy approach to privacy preserving classification with emerging patterns is introduced in the Section by Andruszkiewicz.

Chapter 5 contains 3 sections devoted to the telecommunication applications. In particular, Gawkowski et al. describe a fault injection tool for testing mobile software, called LRFI. The next section, by Andruszkiewicz et al., characterizes required properties of Rich Internet Applications (RIA) and describes an implemented prototype Gears RIA platform for mobile applications. The contribution by Butkiewicz introduces a fuzzy model of Quadrature Phase Shift Keying (QPSK) and Quadrature Amplitude Modulation (QAM modulation) with the applications in transmission of data in telecommunication channels.

In the final chapter advanced methods for customer behavior analysis are described. Rinzivillo and Ruggieri ask ‘Who/where are my new customers?’ and present a symbolic and spacial approach to the problem. Ryżko and Kaczmarek describe an architecture for Customer Experience Management, which enables building customer-centric capabilities in the companies. In the last section Ding and Yada model shopping path by using transition matrix compression algorithm.

We would like to thank all the authors for their contributions to the book. We would also like to thank reviewers and all those programe committee members of the ISMIS2011 conference, who initially revied the papers and classified them for Industrial Session and esentially improved the quality of the presented papers. Thanks go to our sponsors Samsung Electronics Poland and SAS Institute.

May 18, 2011
Warszawa

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