

Preface

More than three decades of research in intelligent information and database systems has principally led from theory to new practical developments. Research issues on big data to gain and share knowledge is probably the most significant example of this. The other example concerns system integrity issues. The industry needs to address these issues through applications focusing on long-term integrity and operational reliability. The complexity of modern information and database systems requires a deep understanding of old issues and the adoption of new insights and experiences to the development of such systems.

Fortunately, recent years have seen remarkable progress on both intelligent information and database systems. These systems invariably involve complex, data-intensive and resource-consuming tasks, which often carry heavy losses in terms of cost in the event of failure. They have regained attention because in many cases large-scale and long-lived applications have to be updated and several new methods have to be developed. Some of the most important of these updates and developments include increased attention to the integration of artificial intelligence, multimedia, social media and database technologies towards the next generation computer systems and services.

The main objective of this book is to contribute to the development of the intelligent information and database systems with the essentials of current knowledge, experience and know-how. Over the last decade new roles for these systems have been discovered, particularly their role as social data and service integrator. Understanding and combining data from different sources has now become a standard practice. Also, the use of statistical methods in a large corpus of data is more efficient and therefore more frequent. But there are expected yet more and different roles to be discovered in the near future.

The scope represented here, relevant to the study of intelligent information and database systems, encompasses a wide spectrum of research topics discussed both from the theoretical and the practical points of view. There are fundamental issues such as algorithmics, artificial and computational intelligence, nature-inspired paradigms, ontologies, collective knowledge, natural language processing, image

processing and temporal databases. On the other hand, there are also a number of interdisciplinary topics outside or close to end-user applications. These concern, for example, heterogeneous and distributed databases, social networks, recommendations systems, web services, etc.

This brand-new volume in the well-established “Studies in Computational Intelligence” series provides a valuable compendium of current and potential problems in the field. It contains a selection of 40 chapters based on the original research accepted for the presentation as posters during *the Asian Conference on Intelligent Information and Database Systems (ACIIDS 2016)* held on 14–16 March 2016 in Da Nang, Vietnam. This is the eighth, in the order, conference jointly organized by Wroclaw University of Technology and its partners.

The selected papers to some extent reflect the achievements of scientific teams from 17 countries in five continents, and report on the progress in theory and application of three main areas: Intelligent information systems, intelligent database systems and tools and applications. More precisely, the book is divided into parts related to six primary topics: Part I. Computational Intelligence in Data Mining and Machine Learning, Part II. Ontologies, Social Networks and Recommendation Systems, Part III. Web Services, Cloud Computing, Security and Intelligent Internet Systems, Part IV. Knowledge Management and Language Processing, Part V. Image, Video, Motion Analysis and Recognition and finally, Part VI. Advanced Computing Applications and Technologies. Each part deals with somewhat different aspects. Let us now consider it in more detail. In Part I, we start with the genetic and memetic algorithms, nature-inspired heuristics, cloud computing, clustering-based classifications, deep learning, artificial neural networks and wi-fi networks. Part II deals with behaviour ontologies, P2P social networks, customer management strategies and recommendations systems. Part III contains six papers about web services, secure communications and integrity of private information. The next part covers collective knowledge management, Internet of Things, natural language processing, sentiment analysis and event detection. In Part V, we cover image processing, human motion capturing, humanoid robots, gesture recognition and emotion detection. The volume closes with Part VI. It presents various practical applications of assistive devices for elderly people, biomedical data integration, epidemiological cancer studies, temporal educational databases, location-based service applications, smart electronic wallet, CT image processing, supply chain management and logistics, and learning management systems.

The book will be an excellent resource for researchers, who are working in the merging of artificial intelligence, multimedia, networks and big data technologies, as well as for students who are interested in computer science, computer engineering, management science, ontological engineering and other related fields.

There are several people whose help has been invaluable in the preparation of this volume. First of all, on behalf of the Steering Committee, the Program Committee and the Organizing Committee we would like to thank all participants, among others, computer scientists, mathematicians, engineers, logicians and other researchers who found it worthwhile to travel to Da Nang from around the world, and who prepared first-rate contributions to these publications. Warm thanks are

also due to the referees who reviewed the chapters with remarkable expertise and engagement. We express a special gratitude to Prof. Janusz Kacprzyk, the editor of this series, and Dr. Thomas Ditzinger from Springer for their interest and support of our project.

Our last but not least observation is that the rise of new generation systems and services is leading to profound changes in overall world functioning. In particular, the Internet is undergoing a transition from the global network to the permanent interconnection between human beings and everyday devices equipped with ubiquitous intelligence. It opens tremendous opportunities for a large number of novel applications that promise to improve the quality of our lives.

We sincerely hope that this volume will be a valuable reference work in your study and research, and you enjoy reading it.

March 2016

Dariusz Król
Lech Madeyski
Ngoc Thanh Nguyen

Recent Developments in Intelligent Information and
Database Systems

Król, D.; Madeyski, L.; NGUYEN, N.-T. (Eds.)

2016, XII, 468 p. 145 illus., 91 illus. in color., Hardcover

ISBN: 978-3-319-31276-7