Studies in Computational Intelligence

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Series editor

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Advanced Topics in Intelligent Information and Database Systems

Springer

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Preface

The concept and scope of information and database systems have been diversified recently and re-attracted widespread attention from academics and researchers at all level of experience. Many years of common practice have indicated that a large set of new techniques might be very helpful to solve some of the challenging real-world problems.

What has really happened? Firstly, the information and database systems have actually incorporated intelligence into their applications. Now, these systems may perform sophisticated, multidisciplinary tasks which are not possible by traditional computing paradigm. Furthermore, intelligent systems can imitate and automate some smart behaviours of thinking being. They are capable of learning, varying their state or action in response to past experience. Secondly, a dramatic increase in our ability to collect data from various devices and applications becomes a big problem. Internet yields every second a huge and constant flood of data. The digital data is doubling in size every two years. Therefore, new developments to exploit these innovations are strongly expected. On the other hand, as technologies become more complex, their links to science become stronger. The modern information and database systems need to address all these issues and updates still requiring further progress in the area.

This timely book published in the flagship Springer series "Studies in Computational Intelligence" presents a theory and practice of the ongoing research in intelligent information and database systems. The focus of this volume is on a broad range of methodological approaches and empirical reference points including algorithmics, artificial and computational intelligence, collaborative systems, decision management and support systems, natural language processing, image and text processing, Internet technologies, and information and software engineering. The carefully selected contributions to this volume were initially accepted for presentation as posters during the 9th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2017) held on 3–5 April 2017 in Kanazawa, Japan.

The level of contributions corresponds to that of advanced scientific works, although several of them could be addressed also to non-expert readers.

The volume brings together 47 chapters divided into six main parts:

- Part I. From Machine Learning to Data Mining.
- Part II. Big Data and Collaborative Decision Support Systems,
- Part III. Computer Vision Analysis, Detection, Tracking and Recognition,
- Part IV. Data-Intensive Text Processing,
- Part V. Innovations in Web and Internet Technologies, and
- Part VI. New Methods and Applications in Information and Software Engineering.

The initial Part I explores different classification algorithms, optimization methods, and data mining techniques. Part II deals with the challenge of managing big and temporal data participating in collaborative, decision-making intelligent systems. Part III examines the latest developments in the field of computer vision and image processing, including collision detection, plant identification, defect classification, parking space prediction, foreground detection, and tracking of bone reparation process. In Part IV, the biggest in this book, we encompass a wide spectrum of approaches to automatic translation, latent semantic analysis, multi-label text classification, content analysis, photo-documentation, sentiment analysis, multi-sentence compression, plagiarism checking, and text summarization. Part V contains topics about indoor positioning, schema validation for open data, job description language, the effectiveness of knowledge-driven Web application, and building responsive data tables. A variety of methods and applications in information and software engineering are presented in the last part of this book (Part VI). It includes the range of subject matter devoted to data-driven forecasting model, compliance checking between the specification and implementation, test data generation, using agile methods, automated test cases generation from UML diagrams, optimal path calculation based on the distance, and finally, solving the state space explosion in modular model checking of component-based software.

In concluding, we would like to thank all the authors contributed to this book. We are also very grateful to the Program Committee members of ACIIDS 2017 who rigorously reviewed the papers with remarkable expertise and always constructive feedback provided to the authors, even under the pressure of extremely tight deadlines. Without often critical but substantive assistance, this volume would have been much less than it is. In addition, we extend our thanks to the editor of this series, Prof. Janusz Kacprzyk, and the executive editor from Springer, Dr. Thomas Ditzinger, for their continuous support and cooperation.

It is worth emphasizing that much theoretical and empirical work remains to be done. It is encouraging to find that more research on intelligent information and

database systems is still required. All things considered, the prospects for the next ACIIDS conferences look good all around.

We hope the readers will find this book interesting, useful, and informative, and it will give them a valuable inspiration for original and innovative research.

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Nomi, Japan — Kiyoaki Shirai
January 2017

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