

Foreword

Since its introduction for market basket analysis in the early 1990s, association rule mining has had a lot of research attention, and it is now widely used in many fields, for example in retail, telecom, insurance, and bioinformatics applications.

One familiar problem encountered in association mining exercises is that they frequently produce large numbers of rules, and this makes it difficult for users to identify those that are of interest. To tackle this problem and facilitate the extraction of useful knowledge from learned rules, Zhao, Zhang, and Cao edited this book to present a systemic collection of the up-to-date techniques for reducing the numbers of association rules, after mining. Such *post-mining* touches on many and varied practical issues, such as the interestingness, redundancy, summarization, generalisation, presentation, visualisation, and maintenance of the rules, and it also involves the understanding of processes and outcomes, as well as new trends and challenges for the analysis of association rules.

This book should be of use to academic researchers in the field of data mining and to industrial data miners. However, it involves clustering, classification and many other techniques of data mining, as well as statistics and artificial intelligence, and it is therefore of wider interest.

This book is composed of six sections, each containing its own chapters. Section I presents an introduction to association rule mining, which covers the association of attributes, and post-mining issues to do with pruning methods, interestingness measures and negative associations. Section II focuses on identifying interesting rules using objective measures, subjective measures, user feedback and combinations of these. A semantics-based classification of interestingness measures is also presented. Section III presents four techniques for the post-analysis of association rules. They are post-processing with a closed set mining technique to eliminate insignificant rules, combining data mining and semantic techniques for classifying the extracted rules, continuous post-mining of association rules, and using a variation of ROC for association rule evaluation. Section IV addresses the needs of associative classifiers and considers how to select high-quality rules for associative classification. Section V presents three new techniques for easy-to-use condensed representation, visualisation, and interactive exploration of association rules. Finally, Section VI presents a survey of methods for the maintenance of association rules, and deals with “conditional contrast pattern mining” and an interesting extension of association mining for multidimensional data models.

This is a stimulating series of chapters, and we believe that they will promote interest and progress in this important aspect of data mining.

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David Bell has been a full professor at Queen's University of Belfast since 2002 and before that he was a full professor at University of Ulster since 1986. He holds a DSc and a PhD degree from the University of Ulster. His research addresses the issues of functionality and performance in data and knowledge management systems, and linking these to reasoning under uncertainty, machine learning, and other artificial intelligence techniques – exploiting the close relationship between evidence and data. For many years he has been a programme committee member of the IEEE Conference on Data Engineering, and several other International Conferences. He has been programme committee chairman of several international conferences, including Very Large Database (VLDB) Conference in 1993. He was a panel member (1994-98) of the UK Cabinet Office's Technology Foresight programme and continues to be an associate member. He is an associate editor of the Pergamon Press journal "Information Systems" and was previously editor-in-chief of another Pergamon Press Journal "Database Technology" and the Computer Journal. He has refereed for many journals. His publication list contains well over 300 papers and books.