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BOOK REVIEW

A. Mucherino, P. J. Papajorgji, P. M. Pardalos: Data mining in agriculture

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1 Introduction

The book "*Data Mining in Agriculture*" presents in a comprehensive way most up-to-date data mining techniques and their application to problems from agriculture domain. Data mining has become one of most active and fertile areas of research and practice due to its wide range of applications, from traditional business and engineering to today's IT technologies. Mining techniques are showing their usefulness also to areas of agriculture and food industry. Nonetheless, compared to other domains, mining techniques have been less explored for agriculture domain applications. The book fulfills thus an important need for researchers, developers and practitioners in the agriculture domain.

The book has a series of features that make it a valuable source for readers interested in data mining techniques and their application to agriculture. Among such features, we could distinguish the tradeoff between the technical details and simplicity of exposition. The authors have not entered into much technical details yet they have presented the main algorithmic aspect of the data mining techniques so that the reader can implement them by himself in programming languages other than C or Matlab used in the book. The exposition is kept easy to follow by means of many examples, illustrations and source code. Thus, the authors keep the reader engaged through several examples and computer programs. Moreover, the reader can control the level of the assimilation of the concepts by running himself the examples or programs found in the book. A self-evaluation is thus possible for the reader. After the reading of the book, the reader will be able to apply most up-to-date data ming techniques for his problems of interest.

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2 Book structure and contents

The presentation of the material is among the most distinguished features and merits of the book. The format of the chapters is the same, which facilitates a lot reading: starting from simple explanations of basic concepts to introducing examples to more in depth explanations makes the material easy to follow.

The book starts with an introduction to data mining concepts, techniques and applications. The reader can also find the relation among data mining and optimization as well as some heuristic resolution methods for near-optimally solving these problems. Chap. 2 gives most commonly used statistical techniques, such as principal component analysis, for mining purposes. Then, from Chap. 3 onward, the most important data mining techniques and applications from agriculture domain are systematically presented. Such techniques include: *Clustering by k-means* (Chap. 3), k–*Nearest Neighbor Classification* (Chap. 4), *Artificial Neural Networks* (Chap. 5), *Support Vector Machines* (Chap. 6) and *Biclustering* (Chap. 7). *Validation techniques* for the presented methods are given in Chap. 8. Although there are many examples of application throughout of the book, a stand alone application is presented in Chap. 9. Finally, the reader interested in efficient implementation of data mining techniques can find in Chap. 10 the use of *Parallel Computing* to speed-up mining processes.

3 Readers of the book

Researchers, practitioners and students will find the book very useful in their activity. The systematic exposition of the materials and the abundant use of examples and graphical representations make the book interesting for a large audience.

General readers interested in data mining will find basic concepts explained in a gentle way and can use the book as an introductory book in data mining. They will also find many examples that will enable them to see the great potential of applications of data mining techniques.

Researchers will find in the book not only a good reference and a compendium of most important techniques but also an "all in one place" analysis of most important data mining techniques: their advantages and drawbacks. The book will thus be very useful to them to choose the most appropriate mining technique for their problem under investigation. It's worth mentioning that some advanced features such as parallel implementation of data mining techniques are also considered in the book.

Students can use the book for studying data mining techniques, without entering into deep technicalities and by "playing" with many examples and ready-to-use programs in either Matlab or C programming language. This is a nice feature of the book—not so often found in this kind of books—where the reader can construct his own examples and find their solutions using the programs provided in the book. The book has thus a strong potential for use in undergraduate and graduate courses.

Teachers can use the book for data mining subjects in undergraduate and graduate studies; in particular they will find useful the exercises as well as many programs for lab practices and small to moderate size projects.