Table of Contents

Foreword ........................................................................................................................................... xvi

Preface ............................................................................................................................................... xvii

Section 1
Beyond the Support-Confidence Framework

Chapter 1
Rare Association Rule Mining: An Overview .................................................................................. 1
  Yun Sing Koh, Auckland University of Technology, New Zealand
  Nathan Rountree, University of Otago, New Zealand

Chapter 2
Association Rule and Quantitative Association Rule Mining among Infrequent Items ............... 15
  Ling Zhou, University of Illinois at Chicago, USA
  Stephen Yau, University of Illinois at Chicago, USA

Chapter 3
Replacing Support in Association Rule Mining .............................................................................. 33
  Rosa Meo, Università di Torino, Italy
  Dino Ienco, Università di Torino, Italy

Chapter 4
Effective Mining of Weighted Fuzzy Association Rules ............................................................... 47
  Maybin Muyeba, Manchester Metropolitan University, UK
  M. Sulaiman Khan, Liverpool Hope University, UK
  Frans Coenen, University of Liverpool, UK
Section 2  
Dealing with Imbalanced Datasets

Chapter 5  
Rare Class Association Rule Mining with Multiple Imbalanced Attributes .......................... 66  
HuaiFeng Zhang, University of Technology, Australia  
Yanchang Zhao, University of Technology, Australia  
Longbing Cao, University of Technology, Australia  
Chengqi Zhang, University of Technology, Australia  
Hans Bohlscheid, Projects Section, Business Integrity Programs Branch, Centrelink, Australia

Chapter 6  
A Multi-Methodological Approach to Rare Association Rule Mining ........................................ 76  
Yun Sing Koh, Auckland University of Technology, New Zealand  
Russel Pears, Auckland University of Technology, New Zealand

Chapter 7  
Finding Minimal Infrequent Elements in Multi-Dimensional Data Defined over Partially  
Ordered Sets and its Applications ........................................................................................................ 98  
Khaled M. Elbassioni, Max-Planck-Institute für Informatik, Saarbrücken, Germany

Section 3  
Rare, Anomalous, and Interesting Patterns

Chapter 8  
Discovering Interesting Patterns in Numerical Data with Background Knowledge ...................... 118  
Szymon Jaroszewicz, National Institute of Telecommunications, Poland

Chapter 9  
Mining Rare Association Rules by Discovering Quasi-Functional Dependencies:  
An Incremental Approach ..................................................................................................................... 131  
Giulia Bruno, Politecnico di Torino, Italy  
Paolo Garza, Politecnico di Torino, Italy  
Elisa Quintarelli, Politecnico di Milano, Italy

Chapter 10  
Mining Unexpected Sequential Patterns and Implication Rules ...................................................... 150  
Dong (Haoyuan) Li, LGI2P, École des Mines d’Alès, France  
Anne Laurent, LIRMM, Université Montpellier II, France  
Pascal Poncelet, LIRMM, Université Montpellier II, France
Chapter 11
Mining Hidden Association Rules from Real-Life Data ......................................................... 168
     Marco-Antonio Balderas Cepeda, Universidad de Granada, Spain

Chapter 12
Strong Symmetric Association Rules and Interestingness Measures .............................. 185
     Agathe Merceron, University of Applied Sciences TFH Berlin, Germany

Section 4
Critical Event Detection and Applications

Chapter 13
He Wasn’t There Again Today ............................................................................................. 205
     Richard A. O’Keefe, University of Otago, New Zealand
     Nathan Rountree, University of Otago, New Zealand

Chapter 14
Filtering Association Rules by Their Semantics and Structures ....................................... 216
     Rangsipan Marukatat, Mahidol University, Thailand

Chapter 15
Creating Risk-Scores in Very Imbalanced Datasets: Predicting Extremely Violent Crime
among Criminal Offenders Following Release from Prison ............................................... 231
     Markus Breitenbach, Northpointe Institute for Public Management, USA
     William Dieterich, Northpointe Institute for Public Management, USA
     Tim Brennan, Northpointe Institute for Public Management, USA
     Adrian Fan, University of Colorado at Boulder, USA

Chapter 16
Boosting Prediction Accuracy of Bad Payments in Financial Credit Applications .................. 255
     Russel Pears, Auckland University of Technology, New Zealand
     Raymond Oetama, Auckland University of Technology, New Zealand

Compilation of References ..................................................................................................... 270

About the Contributors ........................................................................................................... 289

Index ....................................................................................................................................... 296