

Granular Computing and Rough Set Theory

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***RSEISP'07
Warsaw, Poland
June 28, 2007***

Dedicated to the memory of Prof. Z. Pawlak

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LAZ 6/25/2007

Rough Set Theory And Granular Computing

Guoyin Wang, Qing Liu, Yiyu Yao



Rough Set Theory And Granular Computing:

Rough Set Theory and Granular Computing Masahiro Inuiguchi, Shoji Hirano, Shusaku Tsumoto, 2003-04-22 This monograph presents novel approaches and new results in fundamentals and applications related to rough sets and granular computing. It includes the application of rough sets to real world problems such as data mining, decision support and sensor fusion. The relationship of rough sets to other important methods of data analysis: Bayes theorem, neurocomputing and pattern recognition is thoroughly examined. Another issue is the rough set based data analysis including the study of decision making in conflict situations. Recent engineering applications of rough set theory are given including a processor architecture organization for fast implementation of basic rough set operations and results concerning advanced image processing for unmanned aerial vehicles. New emerging areas of study and applications are presented as well as a wide spectrum of ongoing research which makes the book valuable to all interested in the field of rough set theory and granular computing.

Topics in Rough Set Theory Seiki Akama, Yasuo Kudo, Tetsuya Murai, 2019-09-10 This book discusses current topics in rough set theory. Since Pawlak's rough set theory was first proposed to offer a basis for imprecise and uncertain data and reasoning from data, many workers have investigated its foundations and applications. Examining various topical issues including object oriented rough set models, recommendation systems, decision tables and granular computing, the book is a valuable resource for students and researchers in the field.

Rough Set Theory and Granular Computing Masahiro Inuiguchi, Shusaku Tsumoto, Shoji Hirano, 2012-11-26 After 20 years of pursuing rough set theory and its applications, a look on its present state and further prospects is badly needed. The monograph *Rough Set Theory and Granular Computing* edited by Masahiro Inuiguchi, Shoji Hirano and Shusaku Tsumoto meets this demand. It presents the newest developments in this area and gives a fair picture of the state of the art in this domain. Firstly, in the keynote papers by Zdzislaw Pawlak, Andrzej Skowron and Sankar K Pal, the relationship of rough sets with other important methods of data analysis: Bayes theorem, neuro computing and pattern recognition is thoroughly examined. Next, several interesting generalizations of the theory and new directions of research are presented. Furthermore, application of rough sets in data mining in particular, rule induction methods based on rough set theory is presented and discussed. Further, an important issue discussed in the monograph is rough set based data analysis including study of decision making in conflict situations. Last but not least, some recent engineering applications of rough set theory are given. They include a proposal of rough set processor architecture organization for fast implementation of basic rough set operations and discussion of results concerning advanced image processing for unmanned aerial vehicle. Thus the monograph, beside presenting a wide spectrum of ongoing research in this area, also points out new emerging areas of study and applications which makes it a valuable source of information to all interested in this domain.

Data Mining, Rough Sets and Granular Computing Tsau Young Lin, Yiyu Y. Yao, Lotfi A. Zadeh, 2002-04-10 During the past few years, data mining has grown rapidly in visibility and importance within information processing and decision analysis. This

is particularly true in the realm of e commerce where data mining is moving from a nice to have to a must have status In a different though related context a new computing methodology called granular computing is emerging as a powerful tool for the conception analysis and design of information intelligent systems In essence data mining deals with summarization of information which is resident in large data sets while granular computing plays a key role in the summarization process by drawing together points objects which are related through similarity proximity or functionality In this perspective granular computing has a position of centrality in data mining Another methodology which has high relevance to data mining and plays a central role in this volume is that of rough set theory Basically rough set theory may be viewed as a branch of granular computing However its applications to data mining have predated that of granular computing

Rough Sets and Current Trends in Computing Chien-Chung Chan, Jerzy W. Grzymala-Busse, Wojciech P. Ziarko, 2008-10-07 The articles in this volume were selected for presentation at the Sixth International Conference on Rough Sets and Current Trends in Computing RSCTC 2008 which took place on October 23-25 in Akron Ohio USA The conference is a premier event for researchers and industrial professionals interested in the theory and applications of rough sets and related methodologies Since its introduction over 25 years ago by Zdzislaw Pawlak the theory of rough sets has grown internationally and matured leading to novel applications and theoretical works in areas such as data mining and knowledge discovery machine learning neural nets granular and soft computing Web intelligence pattern recognition and control The proceedings of the conferences in this series as well as in Rough Sets and Knowledge Technology RSKT and the Rough Sets Fuzzy Sets Data Mining and Granular Computing RSFDGrC series report a variety of innovative applications of rough set theory and of its extensions Since its inception the mathematical rough set theory was closely connected to application fields of computer science and to other areas such as medicine which provided additional motivation for its further development and tested its real life value Consequently rough set conferences emphasize the interactions and interconnections with related research areas providing forums for exchanging ideas and mutual learning The latter aspect is particularly important since the development of rough set related applications usually requires a combination of often diverse expertise in rough sets and an application field

Rough Sets, Fuzzy Sets, Data Mining, and Granular Computing Guoyin Wang, 2003-05-08 This book constitutes the refereed proceedings of the 9th International Conference on Rough Sets Fuzzy Sets Data Mining and Granular Computing RSFDGrC 2003 held in Chongqing China in May 2003 The 39 revised full papers and 75 revised short papers presented together with 2 invited keynote papers and 11 invited plenary papers were carefully reviewed and selected from a total of 245 submissions The papers are organized in topical sections on rough sets foundations and methods fuzzy sets and systems granular computing neural networks and evolutionary computing data mining machine learning and pattern recognition logics and reasoning multi agent systems and Web intelligence and intelligent systems

Granular Computing: At the Junction of Rough Sets and Fuzzy Sets Rafael Bello, Rafael Falcón, 2008-02-20 This volume is a compilation of the best papers

presented at the First International Symposium on Fuzzy and Rough Sets ISFUROS 2006 held in Santa Clara Cuba They contain valuable contributions both in the theoretical field and in several application domains such as intelligent control data analysis decision making and machine learning just to name a few Together they capture the huge potential of the aforementioned methodologies Rough Sets, Fuzzy Sets, Data Mining, and Granular Computing Yiyu Yao, Qinghua Hu, Hong Yu, Jerzy W. Grzymala-Busse, 2015-11-21 This book constitutes the refereed conference proceedings of the 15th International Conference on Rough Sets Fuzzy Sets Data Mining and Granular Computing RSFDGrC 2015 held in Tianjin China in November 2015 as one of the co located conference of the 2015 Joint Rough Set Symposium JRS 2015 The 44 papers were carefully reviewed and selected from 97 submissions The papers in this volume cover topics such as rough sets the experts speak generalized rough sets rough sets and graphs rough and fuzzy hybridization granular computing data mining and machine learning three way decisions IJCRS 2015 data challenge **Rough Sets, Fuzzy Sets, Data Mining, and Granular Computing** Davide Ciucci, Masahiro Inuiguchi, Yiyu Yao, Dominik Slezak, Guoyin Wang, 2013-10-07 This book constitutes the thoroughly refereed conference proceedings of the 14th International Conference on Rough Sets Fuzzy Sets Data Mining and Granular Computing RSFDGrC 2013 held in Halifax Canada in October 2013 as one of the co located conference of the 2013 Joint Rough Set Symposium JRS 2013 The 69 papers including 44 regular and 25 short papers included in the JRS proceedings LNCS 8170 and LNCS 8171 were carefully reviewed and selected from 106 submissions The papers in this volume cover topics such as inconsistency incompleteness non determinism fuzzy and rough hybridization granular computing and covering based rough sets soft clustering image and medical data analysis Rough - Granular Computing in Knowledge Discovery and Data Mining J. Stepaniuk, 2009-01-29 This book covers methods based on a combination of granular computing rough sets and knowledge discovery in data mining KDD The discussion of KDD foundations based on the rough set approach and granular computing feature illustrative applications **Rough Sets, Fuzzy Sets, Data Mining and Granular Computing** Sergei O. Kuznetsov, Dominik Ślęzak, Daryl H. Hepting, Boris G. Mirkin, 2011-06-14 This book constitutes the refereed proceedings of the 13th International Conference on Rough Sets Fuzzy Sets Data Mining and Granular Computing RSFDGrC 2011 held in Moscow Russia in June 2011 The 49 revised full papers presented together with 5 invited and 2 tutorial papers were carefully reviewed and selected from a total of 83 submissions The papers are organized in topical sections on rough sets and approximations coverings and granules fuzzy set models fuzzy set applications compound values feature selection and reduction clusters and concepts rules and trees image processing and interactions and visualization **Rough Sets, Fuzzy Sets, Data Mining, and Granular Computing** Dominik Slezak, Marcin Szczuka, Ivo Dumentsch, Yiyu Yao, 2005-09-19 This volume contains the papers selected for presentation at the 10th International Conference on Rough Sets Fuzzy Sets Data Mining and Granular Computing RSFDGrC 2005 organized at the University of Regina August 31st September 3rd 2005 This conference followed in the footsteps of international events

devoted to the subject of rough sets held so far in Canada China Japan Poland Sweden and the USA RSFDGrC achieved the status of biennial international conference starting from 2003 in Chongqing China The theory of rough sets proposed by Zdzislaw Pawlak in 1982 is a model of approximate reasoning The main idea is based on indiscernibility relations that describe indistinguishability of objects Concepts are represented by proximations In applications rough set methodology focuses on approximate representation of knowledge derivable from data It leads to significant results in many areas such as finance industry multimedia and medicine The RSFDGrC conferences put an emphasis on connections between rough sets and fuzzy sets granular computing and knowledge discovery and data mining both at the level of theoretical foundations and real life applications In the case of this event additional effort was made to establish a linkage towards a broader range of applications We achieved it by including in the conference program the workshops on bioinformatics security engineering and embedded systems as well as tutorials and sessions related to other application areas

Rough Set Theory: A True Landmark in Data Analysis Ajith Abraham, Rafael Falcón, Rafael Bello, 2009-02-26 Part 1 of this book deals with theoretical contributions of rough set theory and parts 2 and 3 focus on several real world data mining applications The book thoroughly explores recent results in rough set research

Rough Sets and Intelligent Systems Paradigms Marzena Kryszkiewicz, 2007-06-18 This book constitutes the refereed proceedings of the International Conference on Rough Sets and Emerging Intelligent Systems Paradigms RSEISP 2007 held in Warsaw Poland in June 2007 dedicated to the memory of Professor Zdzislaw Pawlak The 73 revised full papers presented together with 2 keynote lectures and 11 invited papers were carefully reviewed and selected from numerous submissions The papers are organized in topical sections on foundations of rough sets foundations and applications of fuzzy sets granular computing algorithmic aspects of rough sets rough set applications rough fuzzy approach information systems and rough sets data and text mining machine learning hybrid methods and applications multiagent systems applications in bioinformatics and medicine multimedia applications as well as web reasoning and human problem solving

Incomplete Information System and Rough Set Theory Xibei Yang, Jingyu Yang, 2012-12-15 Incomplete Information System and Rough Set Theory Models and Attribute Reductions covers theoretical study of generalizations of rough set model in various incomplete information systems It discusses not only the regular attributes but also the criteria in the incomplete information systems Based on different types of rough set models the book presents the practical approaches to compute several reducts in terms of these models The book is intended for researchers and postgraduate students in machine learning data mining and knowledge discovery especially for those who are working in rough set theory and granular computing Dr Xibei Yang is a lecturer at the School of Computer Science and Engineering Jiangsu University of Science and Technology China Jingyu Yang is a professor at the School of Computer Science Nanjing University of Science and Technology China

Rough Sets, Fuzzy Sets, Data Mining, and Granular Computing Guoyin Wang, Qing Liu, Yiyu Yao, 2014-01-15

Rough Sets and Current Trends in Computing Shusaku

Tsumoto, Roman Slowiński, Jan Komorowski, Jerzy W. Grzymala-Busse, 2004-05-21 In recent years rough set theory has attracted the attention of many researchers and practitioners all over the world who have contributed essentially to its development and applications. We are observing a growing research interest in the foundations of rough sets including the various logical, mathematical and philosophical aspects of rough sets. Some relationships have already been established between rough sets and other approaches and also with a wide range of hybrid systems. As a result, rough sets are linked with decision system modeling and analysis of complex systems, fuzzy sets, neural networks, evolutionary computing, data mining and knowledge discovery, pattern recognition, machine learning and approximate reasoning. In particular, rough sets are used in probabilistic reasoning, granular computing including information granule calculi based on rough mereology, intelligent control, intelligent agent modeling, identification of autonomous systems and process specification. Methods based on rough set theory alone or in combination with other approaches have been discovered with a wide range of applications in such areas as acoustics, bioinformatics, business and finance, chemistry, computer engineering (e.g. data compression, digital image processing, digital signal processing, parallel and distributed computer systems, sensor fusion, fractal engineering, decision analysis and systems, economics, electrical engineering (e.g. control, signal analysis, power systems), environmental studies, informatics, medicine, molecular biology, musicology, neurology, robotics, social science, software engineering, spatial visualization, Web engineering and Web mining. *Rough Sets, Fuzzy Sets, Data Mining and Granular Computing* Aijun An, Jerzy Stefanowski, Sheela Ramanna, Cory Butz, Witold Pedrycz, 2007-08-22 This book constitutes the refereed proceedings of the 11th International Conference on Rough Sets, Fuzzy Sets, Data Mining and Granular Computing RSFDGrC 2007 held in Toronto, Canada, in May 2007 in conjunction with the Second International Conference on Rough Sets and Knowledge Technology RSKT 2007 both as part of the Joint Rough Set Symposium JRS 2007. **Data Mining, Rough Sets and Granular Computing** Tsau Young Lin, Yiyu Y. Yao, Lotfi A. Zadeh, 2014-01-15 *Rough Sets and Current Trends in Computing* James J. Alpigini, James F. Peters, Andrzej Skowron, Ning Zhong, 2003-08-03 This volume contains the papers selected for presentation at the Third International Conference on Rough Sets and Current Trends in Computing RSCTC 2002 held at Penn State Great Valley, Malvern, Pennsylvania, U.S.A., 14-16 October 2002. Rough set theory and its applications constitute a branch of soft computing that has exhibited a significant growth rate during recent years. RSCTC 2002 provided a forum for exchanging ideas among many researchers in the rough set community and in various areas of soft computing and served as a stimulus for mutual understanding and cooperation. In recent years there have been a number of advances in rough set theory and applications. Hence we have witnessed a growing number of international workshops on rough sets and their applications. In addition, it should be observed that one of the beauties of rough sets and the rough set philosophy is that it tends to complement and reinforce research in many traditional research areas and applications. This is the main reason that many international conferences are now including rough sets into the list of topics.

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