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Proceedings of the Second International Conference on Rough Sets and Current Trends in Computing (RSCTC'2000)

Banff, Canada, October 16-19, 2000

Technical Report CS-2000-07
September 2000

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ISSN 0828-3494
ISBN 0-7731-0413-5

Preface

This volume contains papers selected for presentation at the Second International Conference on Rough Sets and Current Trends in Computing (RSCTC'2000) held in the beautiful Rocky Mountains resort town of Banff in Canada, October 16-19, 2000. The main theme of the conference is centered around the theory of rough sets, its applications and the theoretical development. The program also includes numerous research papers representing areas which are related to rough sets such as fuzzy sets, data mining, machine learning, pattern recognition, uncertain reasoning, neural nets and genetic algorithms, and some selected papers from other areas of computer science. This composition of various research areas is a reflection of the general philosophy of trying to bring together researchers representing different, but often closely related, research paradigms to enhance mutual understanding and to stimulate the exchange of ideas and sometimes of very diverse points of view on similar problems. The conference, the second in the series, stems from annual workshops devoted to the topic of rough sets initiated in 1992 in Kiekrz, Poland (the second workshop was also held in Banff in 1993). The first conference was held in 1998 in Warszawa, Poland, followed by the most recent workshop organized in Yamaguchi, Japan in 1999.

It has been over twenty years now since the first introduction of basic ideas and definitions of rough set theory by Dr. Zdzislaw Pawlak. As many other ideas of Dr. Pawlak, the theory of rough sets belongs now to the standard vocabulary of Computer Science research, in particular research related to uncertain reasoning, data mining, machine learning, pattern recognition, just to mention a few. In this context, one could ask the question as to what makes this theory so attractive in all these other areas which have already developed methodologies of their own. It seems that the universality of the theory is the keyword. It touches the very essence of the set definition, one of the fundamental notions of modern mathematics. The standard set theory is closely related to Boolean logic which in turn is in the heart of the operation of digital computers. It is well known that many practical problems cannot be solved satisfactorily by programming existing computers, in particular problems related to learning, pattern recognition, some forms of control etc. The difficulty stems from the fact that often it is impossible to create black-and-white algorithmic descriptions of the objects of interest occurring in different application areas, for example wave form patterns occurring in sound analysis. The theory of rough sets and its extensions provide rigorous mathematical techniques for creating approximate descriptions of such objects, for analyzing, optimizing and recognizing the limits of what can be effectively distinguished (i.e. classified) by means of the available object representation. This is not to say that all these difficult complex object classification-related problems would be automatically solved with the adoption of the rough set approach. Instead, the rough set approach provides a common philosophical framework supported by precise mathematical language for dealing with these problems. However, the details of specific solutions must be supplied by experts working in particular subject areas. Past experience indicates that the rough set approach is a team-oriented methodology. Usually a single individual does not have the expertise required for the effective application of the rough set approach to a practical problem. This means that developing practical applications of this methodology is difficult and costly. From the perspective of conference organizers it also means the relative rarity of application-oriented publications, and we would wished to have more of them. This imbalance was visible in previous workshops and conferences on the subject and is repeated here. We have fine collection of fine theoretical papers but application papers are few. Consequently, the proceedings are organized along the subject lines without further separation into theoretical versus practical papers. We sincerely hope that the current strong theoretical growth of rough set approach, as demonstrated in this volume, will eventually lead to the parallel growth in the application side resulting in stronger participation of industrial users of the methodology.

The RSCTC'2000 program was further enhanced by invited keynote speakers: Setsuo Ohsuga and Zdzislaw Pawlak, and invited plenary speakers: Jan Komorowski, Roman Swiniarski, and Jan Żytkow, and a special session on Granular Computing organized by James F. Peters.

The success of RSCTC'2000 is the result of the joint efforts of authors, Advisory Board, Program Committee and referees. We want to thank the authors for deciding to publish their research at this conference and for their patience during some delays when processing the submissions. The preparation of this volume would not be possible without help of referees and the members of the Advisory Board and the Program Committee to whom we would like to express our thanks and appreciation for the time and effort they put in the refereeing and paper selection process. We want to thank Program Committee Chairs Andrzej Skowron (Europe) and Shusaku Tsumoto (Asia) for their kind support and advice on various issues. We are grateful to our sponsors: Faculty of Science, University of Regina, and President's Office, University of Regina. Much of the research on rough sets and other topics presented in this volume has been supported by research grants from Natural Science and Engineering Research Council of Canada. This support is gratefully acknowledged.

July 1999 Wojciech Ziarko, Yiyu Yao

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