Contents – Part I

Invited Talks

Zdzisław Pawlak: Man, Creator and Innovator of Computer Sciences:
Personal Memories .............................................................. 3
   Urszula Wybraniec-Skardowska

Data-Driven Granular Cognitive Computing .......................... 13
   Guoyin Wang

Advances in Rough Set Based Hybrid Approaches for Medical
Image Analysis ................................................................. 25
   Pradipta Maji

User Friendly NPS-Based Recommender System for Driving
Business Revenue ............................................................... 34
   Zbigniew W. Ras, Katarzyna A. Tarnowska, Jieyan Kuang,
   Lynn Daniel, and Doug Fowler

The Multi-purpose Role of the Relational Approach to Classic
and Generalized Approximation Spaces. A Tutorial .................. 49
   Piero Pagliani

General Rough Sets

Heterogeneous Approximate Reasoning with Graded Truth Values ...... 61
   Francesco Luca De Angelis, Giovanna Di Marzo Serugendo,
   Barbara Dunin-Kęplicz, and Andrzej Szalas

Computer Certification of Generalized Rough Sets Based on Relations ...... 83
   Adam Grabowski

New Algebras and Logic from a Category of Rough Sets .................. 95
   Anuj Kumar More and Mohua Banerjee

Rough and Near: Modal History of Two Theories ........................ 109
   Marcin Wolski and Anna Gomolińska

Multi-stage Optimization of Matchings in Trees with Application
to Kidney Exchange .......................................................... 123
   Michal Mankowski and Mikhail Moshkov

A Rough-Set Based Solution of the Total Domination Problem .......... 131
   Anhui Tan, Yuzhi Tao, and Chao Wang
Yet Another Kind of Rough Sets Induced by Coverings
Ryszard Janicki

Approximation Operators in Covering Based Rough Sets
from Submodular Functions
Mauricio Restrepo

Toward Adaptive Rough Sets
Soma Dutta and Andrzej Skowron

Optimal Scale Selections in Consistent Generalized Multi-scale
Decision Tables
You-Hong Xu, Wei-Zhi Wu, and Anhui Tan

A Framework for Analysis of Granular Neural Networks
Julian Skirzyński

Petri Nets over Ontological Graphs: Conception and Application
for Modelling Tasks of Robots
Jarosław Szkoła and Krzysztof Pancerz

Fractal Analysis Approaches to Granular Computing
JingTao Yao, Oladunni A. Oladimeji, and Yan Zhang

Generating Natural Language Explanations from Knowledge-Based
Systems Results, Using Ontology and Discourses Patterns
Víctor Flores, Yahima Hadfeg, and Claudio Meneses

Discernibility Matrix and Rules Acquisition Based Chinese Question
Answering System
Zhao Han, Duoqian Miao, Fuji Ren, and Hongyun Zhang

Methods Based on Pawlak’s Model of Conflict
Analysis - Medical Applications
Małgorzata Przybyła-Kasperek

Comprehensive Operational Control of the Natural and Anthropogenic
Territory Safety Based on Analytical Indicators.
Tatiana Penkova, Valeriy Nicheporchuk, and Anna Metus

Metaphor Detection Using Fuzzy Rough Sets
Sunny Rai and Shampa Chakraverty

Acr2Vec: Learning Acronym Representations in Twitter
Zhifei Zhang, Sheng Luo, and Shuwen Ma

Attribute Reduction on Distributed Incomplete Decision
Information System
Jun Hu, Kai Wang, and Hong Yu
The Attribute Reductions Based on Indiscernibility and Discernibility Relations
Keyun Qin and Sihui Jing

Stable Rules Evaluation for a Rough-Set-Based Bipolar Model: A Preliminary Study for Credit Loan Evaluation
Kao-Yi Shen, Hiroshi Sakai, and Gwo-Hshiung Tzeng

On Combining Discretisation Parameters and Attribute Ranking for Selection of Decision Rules
Urszula Stańczyk and Beata Zielosko

Induction of Rule for Differential Diagnosis
Shusaku Tsumoto and Shoji Hirano

Attribute Reduction: An Ensemble Strategy
Suping Xu, Pingxin Wang, Jinhai Li, Xibei Yang, and Xiangjian Chen

On Importance of Rows for Decision Tables
Hassan AbouEisha, Mohammad Azad, and Mikhail Moshkov

Assignment Reduction of Relation Decision Systems
Guilong Liu

Automatically Determining the Popularity of a Song
Costin Chiru and Oana-Georgiana Popescu

iPDO: An Effective Feature Depth Estimation Method for 3D Face Reconstruction
Xun Gong, Xinxin Li, Shengdong Du, and Yang Zhao

Proposal of Dominance-Based Rough Set Approach by STRIM and Its Applied Example
Yuichi Kato, Takahiro Itsuno, and Tetsuro Saeki

Regularization and Shrinkage in Rough Set Based Canonical Correlation Analysis
Ankita Mandal and Pradipta Maji

Temporal Relations of Rough Anti-patterns in Software Development
Łukasz Puławski

Temporal Prediction Model for Social Information Propagation
Fei Teng, Rong Tang, Yan Yang, Hongjie Wang, and Rongjie Dai

Characteristic Sets and Generalized Maximal Consistent Blocks in Mining Incomplete Data
Patrick G. Clark, Cheng Gao, Jerzy W. Grzymala-Busse, and Teresa Mroczek
Rough Sets in Incomplete Information Systems with Order Relations
Under Lipski’s Approach ................................................................. 487

Michinori Nakata, Hiroshi Sakai, and Keitarou Hara

A Measure of Inconsistency for Simple Decision Systems
over Ontological Graphs ................................................................. 507

Krzysztof Pancerz

A Rough View on Incomplete Information in Games .......................... 523

Georg Peters

A Proposal of Machine Learning by Rule Generation from Tables
with Non-deterministic Information and Its Prototype System .......... 535

Hiroshi Sakai, Michinori Nakata, and Junzo Watada

Rough Set Analysis of Classification Data with Missing Values ........ 552

Marcin Szelag, Jerzy Blaszczynski, and Roman Slowinski

The Optimal Estimation of Fuzziness Parameter in Fuzzy
C-Means Algorithm ................................................................. 566

Hsun-Chih Kuo and Yu-Jau Lin

Supercluster in Statics and Dynamics: An Approximate Structure
Imitating a Rough Set ................................................................. 576

Ivan Rodin and Boris Mirkin

Integration of Gene Expression and Ontology for Clustering
Functionally Similar Genes ........................................................... 587

Sushmita Paul

Multi-view Clustering Algorithm Based on Variable Weight and MKL .... 599

Peirui Zhang, Yan Yang, Bo Peng, and Mengjiao He

An Overlapping Clustering Approach with Correlation Weight .......... 611

Yingge Xu, Yan Yang, Hongjun Wang, and Jie Hu

Software and Systems for Rough Sets

A Metadata Diagnostic Framework for a New Approximate Query
Engine Working with Granulated Data Summaries ....................... 623

Agnieszka Chodzynska-Krasowska, Sebastian Stawicki,
and Dominik Slezak

Scalable Maximal Discernibility Discretization for Big Data ............. 644

Michal Czolombitko and Jaroslaw Stepniuk
Contents – Part II

Vagueness, Rough Sets, Mereology

Approximations from Anywhere and General Rough Sets .......................... 3
A. Mani

Generalized Ideals and Co-granular Rough Sets ................................. 23
A. Mani

Certainty-Based Rough Sets ................................................................. 43
Davide Ciucci and Ivan Forcati

The Rough Membership Function on One Type of Covering-Based
Rough Sets and Its Applications ......................................................... 56
Xun Ge, Jianguo Tang, and Pei Wang

Mereogeometry Based Approach for Behavioral Robotics ....................... 70
Piotr Gnyś

Distinguishing Vagueness from Ambiguity in Dominance-Based Rough Set
Approach by Means of a Bipolar Pawlak-Brouwer-Zadeh Lattice ............ 81
Salvatore Greco, Benedetto Matarazzo, and Roman Słowiński

Similarity Based Rough Sets ............................................................... 94
Dávid Nagy, Tamás Mihálydeák, and László Aszalós

On Mereology as a Tool in Problems of Intelligent Control, Granular
Computing, Data Analysis and Approximate and Spatial Reasoning ........ 108
Lech Polkowski

A Topological Approximation Space Based on Open Sets of Topology
Generated by Coverings ................................................................. 130
Bożena Staruch and Bogdan Staruch

Actual Existence Predicate in Mereology and Mereotopology
(Extended Abstract) ........................................................................... 138
Dimiter Vakarelov

Path Planning Based on Potential Fields from Rough Mereology ............ 158
Łukasz Zmudzinski and Piotr Artiemjew
Three-Way Decisions, Uncertainty, Granular Computing

Three-Way Decision Community Detection Algorithm Based on Local Group Information .................................................. 171
   Jie Chen, Liandi Fang, Yanping Zhang, Shu Zhao, Ling Zhang,
   Fulan Qian, Feng Liu, Xiangyang Wang, and Xuegang Hu

Actionable Strategies in Three-Way Decisions with Rough Sets ............. 183
   Cong Gao and Yiyu Yao

Rough Set Approximations in an Incomplete Information Table ............ 200
   Mengjun J. Hu and Yiyu Y. Yao

Two Novel Decomposition Approaches for Knowledge Acquisition Model. ................................................................. 216
   Na Jiao

Three-Way Decisions with DEA Approach........................................ 226
   Dun Liu and Decui Liang

Covering-Based Optimistic Multigranulation Decision-Theoretic Rough Sets Based on Maximal Descriptors ................................. 238
   Caihui Liu, Meizhi Wang, and Nan Zhang

A Three-Way Decision Model Based on Intuitionistic Fuzzy Decision Systems ............................................................... 249
   Jiubing Liu, Xianzhong Zhou, Bing Huang, and Huaxiong Li

Sequential Three-Way Decisions in Efficient Classification of Piecewise Stationary Speech Signals ........................................ 264
   Andrey V. Savchenko

A Three-Way Recommender System for Popularity-Based Costs ........... 278
   Yuan-Yuan Xu, Heng-Ru Zhang, and Fan Min

Three-Way Decisions Based on Intuitionistic Fuzzy Sets ......................... 290
   Xiaoping Yang and Anhui Tan

A Framework of Three-Way Cluster Analysis.................................... 300
   Hong Yu

A Semi-supervised Three-Way Clustering Framework for Multi-view Data ................................................................. 313
   Hong Yu, Xincheng Wang, and Guoyin Wang

Determining Thresholds in Three-Way Decisions:
A Multi-object Optimization View .................................................. 326
   Yuanjian Zhang, Duoqian Miao, Jianfeng Xu, and Zhifei Zhang
Three-Way Decisions Cost Model Based on Continuous Domain .......... 340
   Tao Zhang, Qinghua Zhang, and Chenchen Yang

Conflict Analysis for Pythagorean Fuzzy Information Systems ............ 359
   Guangming Lang, Duoqian Miao, Zhifei Zhang, and Ning Yao

Attribute Reduction in Utility-Based Decision-Theoretic
Rough Set Models. ................................................................. 368
   Nan Zhang, Lili Jiang, and Caihui Liu

Dynamic Three Way Decisions and Its Application Based
on Two-Direction PS-Probabilistic Rough Set. ............................... 376
   Chunying Zhang, Liya Wang, and Baoxiang Liu

Recent Advances in Biomedical Data Analysis, Trends
in Multi-Agent Systems, Formal Concept Analysis, Rough Set Theory
and Their Applications

Robust Sigmoidal Control Response of C. elegans Neuronal Network ....... 393
   Rahul Badhwar and Ganesh Bagler

Resolving the Conflicts Between Cuts in a Decision Tree
with Verifying Cuts. .................................................................. 403
   Sylwia Buregwa-Czuma, Jan G. Bazan, Stanisława Bazan-Socha,
   Wojciech Rzasa, Łukasz Dydo, and Andrzej Skowron

Depression Behavior Detection Model Based on Participation
in Serious Games ....................................................................... 423
   Rytis Maskeliūnas, Tomas Blažauskas, and Robertas Damaševičius

Persuasive Strategies in Dialogue Games with Emotional Reasoning .... 435
   Magdalena Kacprzak

An Approach for Hospital Planning with Multi-Agent Organizations ...... 454
   John Bruntse Larsen and Jørgen Villadsen

A Novel Description Language for Two-Agent Dialogue Games .......... 466
   Anna Sawicka, Magdalena Kacprzak, and Andrzej Zbrzezny

Simple SMT-Based Bounded Model Checking for Timed
Interpreted Systems .................................................................. 487
   Agnieszka M. Zbrzezny and Andrzej Zbrzezny

A Neural Network Pattern Recognition Approach to Automatic Rainfall
Classification by Using Signal Strength in LTE/4G Networks .......... 505
   Francesco Beritelli, Giacomo Capizzi, Grazia Lo Sciuto,
   Francesco Scaglione, Dawid Polap, and Marcin Woźniak
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute Reduction in Rough Set Theory and Formal Concept Analysis</td>
<td>513</td>
</tr>
<tr>
<td><em>María José Benítez-Caballero, Jesús Medina,</em> and <em>Eloisa Ramírez-Poussa</em></td>
<td></td>
</tr>
<tr>
<td>Toward Interactive Attribute Selection with Infolattices – A Position Paper</td>
<td>526</td>
</tr>
<tr>
<td><em>Dominik Ślęzak, Marek Grzegorowski, Andrzej Janusz,</em> and <em>Sebastian Stawicki</em></td>
<td></td>
</tr>
<tr>
<td>AFS-Based Formal Concept Analysis on Multi-valued Context.</td>
<td>540</td>
</tr>
<tr>
<td><em>Lidong Wang, Xiaodong Liu,</em> and <em>Jinhai Li</em></td>
<td></td>
</tr>
<tr>
<td>Turning Krimp into a Triclustering Technique on Sets of Attribute-Condition Pairs that Compress.</td>
<td>558</td>
</tr>
<tr>
<td><em>Maxim Yurov</em> and <em>Dmitry I. Ignatov</em></td>
<td></td>
</tr>
<tr>
<td>Classification Model Based on Topological Approximation Space.</td>
<td>570</td>
</tr>
<tr>
<td><em>Bożena Staruch</em></td>
<td></td>
</tr>
<tr>
<td><strong>Author Index</strong></td>
<td>579</td>
</tr>
</tbody>
</table>
Rough Sets
International Joint Conference, IJCRS 2017, Olsztyn, Poland, July 3-7, 2017, Proceedings, Part I
2017, L, 693 p. 147 illus., Softcover
ISBN: 978-3-319-60836-5