

Table of Contents

Plenary talks	23
Do we need fuzzy cluster analysis?	
FRANK KLAWONN	25
Preference Learning in Evolutionary Multiobjective Optimization	
ROMAN SŁOWIŃSKI	26
Protecting data privacy in emerging scenarios	
SABRINA DE CAPITANI DI VIMERCATI	27
Handling Uncertainty in Dynamical Systems: Challenges and Opportunities	
MARTINE CEBERIO	28
Fuzzy implication functions 2.0: From theoretical results to applications and vice versa	
SEBASTIA MASSANET	29
IJCRS invited talks	31
Rough sets, fuzzy sets, ill-known sets and related topics: a discussion	
DIDIER DUBOIS	33
Classification of multi-class imbalanced data: data difficulty factors and selected methods for improving classifiers	
JERZY STEFANOWSKI	35
Rough-fuzzy segmentation of brain MR volumes: applications in tumor detection and malignancy assessment	
PRADIPTA MAJI	36
FQAS invited talks	37
Analogical querying?	
HENRI PRADE, GILLES RICHARD	39
On Controlling Skyline Query Results: What Does Soft Computing Bring?	
ALLEL HADJALI	40
Management of Complex and Fuzzy Queries Using a Fuzzy SOLAP-Based Framework	
SINAN KESKIN, ADNAN YAZICI	41
Aggregation for flexible Challenge Response	
SAMUEL BREZANI, PETER VOJTÁŠ	42

The Impact of User Demographics and Task Types on Cross-App Mobile Search	
MOHAMMAD ALIANNEJADI, FABIO CRESTANI, THEO HUIBERS, MONICA LANDONI, EMILIANA MURGIA, MARIA SOLEDAD PERA	43
Abstracts of IFSA-EUSFLAT	45
Fuzzy Partitions and Multi-Scale Representation of 1D Data	
I. PERFILIEVA, D. ADAMCZYK	47
F^1-transform in fuzzy Fredholm integral equations	
I. PERFILIEVA, T. PHAM	47
On quotient structures of fuzzy multiset finite automata	
A. P. SINGH, M. K. DUBEY, I. PERFILIEVA	47
Laplacian Singular Values	
J. JANEČEK, I. PERFILIEVA	47
Optimizing Feature Importance in the Decision Making Phase for Motor Imagery Brain Computer Interfaces using Automatic Differentiation	
J. FUMANAL IDOCIN, M. PAPCO, F. J. FERNANDEZ, G. DIMURO, C. VIDAURRE, M. GÓMEZ, H. BUSTINCE	47
Fusion of local features by means of linear combinations of increasing functions on Convolution Neural Networks	
I. RODRÍGUEZ-MARTÍNEZ, J. LAFUENTE, R. H. N. SANTIAGO, M. SESMA, F. HERRERA, P. URSÚA, H. BUSTINCE	48
Sequential information fusion based in multidimensional Choquet-like discrete integral	
M. FERRERO-JAURRIETA, Z. TAKÁČ, Ľ. HORANSKÁ, I. RODRÍGUEZ-MARTÍNEZ, G. PEREIRA, H. BUSTINCE	48
Modification of the ADALINE using Choquet integrals and their generalizations	
A. URIO, H. BUSTINCE, L. DE MIGUEL, F. J. FERNANDEZ, G. DIMURO, Z. TAKÁČ	49
Fuzzy optimization multi-objective clustering ensemble model for multi-source data analysis	
L. CAM BINH, P. VAN NHA, N. THANH LONG	49
Evolving Fuzzy Neural Network based on Uni-nullneuron to identify Auction Fraud	
P. V. DE CAMPOS SOUZA, E. LUGHOFFER, A. JUNIO GUIMARAES	49
Convexity of Interval-valued Fuzzy Sets Applied to Decision Making Problems	
P. HUIDOBRO, P. ALONSO, V. JANIŠ, S. MONTES	49
Solution to the Advection Equation with Fuzzy Initial Condition via Sup-J Extension Principle	
V. WASQUES, E. ESMI, L. BARROS	50
Bidimensional fuzzy initial value problem of autocorrelated fuzzy processes via cross product: the prey-predator model	
B. LAIATE, L. BARROS, F. SANTO PEDRO, E. ESMI	50

Discrete Laplace Operator in the Space with a Fuzzy Partition	
H. ZÁMEČNÍKOVÁ, I. PERFILIEVA	50
Reconstruction of residuated lattice-valued functions by integral transforms	
M. HOLČAPEK, V. BUI QUOC	50
Extending representability on the set of intervals endowed with admissible orders for the construction of interval-valued fuzzy operators	
L. SILVA, G. SCHNEIDER, B. FREITAS, A. YAMIN, H. SANTOS, B. BEDREGAL, R. REISER	51
Interpretable monotonicities for entropies of intuitionistic fuzzy sets or interval-valued fuzzy sets	
C. MARSALA, B. BOUCHON-MEUNIER	51
Description of maximal Archimedean t-norms on finite chains	
C. BEJINES LÓPEZ, M. NAVARA	51
On t-Conorm Based Fuzzy (Pseudo)metrics and Applications in Combinatorics on Words	
R. BĚTS	51
A Numerical Approach For Determining Interactivity: A Case Study in Chemical Degradation	
P. SUSSNER, V. WASQUES, J. C. FERNANDES, E. ESMI	52
Graded fuzzy preconcept lattices: Theoretical basis	
A. ŠOSTAK, I. ULJANE, M. KRASTINŠ	52
Simulations of fuzzy dynamical systems	
N. ŠKORUPOVÁ	52
On notions of fuzzy topological entropy	
J. KUPKA, J. CÁNOVAS	52
Monadic power set theories in Kleisli categories	
J. MOČKOŘ	52
Closure systems as a fuzzy extension of meet-subsemilattices	
M. OJEDA-HERNÁNDEZ, I. P. CABRERA, P. CORDERO, E. MUÑOZ-VELASCO	52
How some methods in fuzzy sets, fuzzy soft sets, hesitant fuzzy sets and intuitionistic fuzzy sets can be unified?	
J. MOČKOŘ	53
Fuzzy partitioned discrete-event systems under controllability	
S. SINGH, S. TIWARI	53
Audio surveillance of road traffic: An approach based on anomaly detection and interval type-2 fuzzy sets	
S. ROVETTA, Z. MNASRI, F. MASULLI, A. CABRI	53
Fuzzy object interpretation for improved performance in active contour models	
A. MIR, F. J. FERNANDEZ, L. DE MIGUEL, C. LOPEZ-MOLINA	53
Estimating Polychoric Correlations from Fuzzy Frequency Tables	
A. CALCAGNI	53
Restricted Equivalence Functions on L^n : A new equivalence measure between n-multisets applied on color pixels for image comparison	
A. CASTILLO-LÓPEZ, Z. TAKÁČ, C. LOPEZ-MOLINA, F. J. FERNANDEZ, H. BUSTINCE	54

Using automatic facial emotion recognition for content analyses of a language learner video corpus	
X. CHEN, Y.-Y. HSU, E. CHERSONI	54
Fuzzy Property Grammar and Fuzzy Natural Logic for describing linguistic vagueness	
A. TORRENS	55
How NLP Can Benefit From a Fuzzy Classification of Language Universals	
A. BROSA RODRÍGUEZ	55
Towards a Fuzzy Model for Approaching Verbal Violence	
S. M. CAMPILLO-MUÑOZ, M. D. JIMENEZ-LOPEZ	56
Probabilistic and Standard Fuzzy Systems in Fuzzy Natural Logic: A Comparison in Time Series Modeling	
N. LINH	57
Interpolativity and Continuity of Similarity-Based Reasoning Fuzzy Inference	
S. MANDAL, B. JAYARAM	57
Similarity-based reasoning from the perspective of extensionality	
A. DVOŘÁK, B. JAYARAM, M. ŠTĚPNIČKA	57
Linear Regression Approach to Fuzzy Cognitive Maps with History Data	
V. NISKANEN	58
Detection of anomalies in sensor data using neurofuzzy systems	
F. RODRÍGUEZ, W. D. CHICAIZA, A. J. SÁNCHEZ, J. M. ESCAÑO	58
Nonlinear Fuzzy Model Predictive Control of the TCP-100 Parabolic Trough Plant	
J. M. ESCAÑO, A. J. GALLEGU, A. J. SÁNCHEZ, L. J. YEBRA, E. F. CAMACHO	58
Neuro-fuzzy modelling of a linear Fresnel-type solar collector system as a digital twin	
W. D. CHICAIZA, A. J. SÁNCHEZ, A. J. GALLEGU, J. M. ESCAÑO	58
A Fuzzy-based approach for energy management of DHW systems in hotels	
M. LLANO, R. MESA-CRUZ, A. HAMILTON, J. F. ACOSTA, J. A. MENDEZ PEREZ	58
Fuzzy Clustering-based Switching Non-negative Matrix Factorization and Its Application to Environmental Data Analysis	
K. HONDA, T. FURUKAWA, S. UBUKATA, A. NOTSU	58
Discovery of pairwise ordinal edit rules	
M. PEELMAN, A. BRONSELAER, G. DE TRÉ	58
Fuzzy co-clustering algorithm for multi-source data mining	
L. CAM BINH, P. VAN NHA, P. THE LONG	59
Analysis of the relation among global stocks using Fuzzy/Linguistic IF-THEN rules	
S. MIRSHAHI, S. MIRSHAHI, V. NOVÁK	59
DC Microgrid Control Containing Virtual Supercapacitor	
N. PIRI YENGIJEH, H. MORADI CHESHMEHBEIGI, K. ROUZBEHI	59
A soundness test for multi criteria decision models with imprecise data	
C. FRANCO DE LOS RÍOS, J. L. HOUGAARD	59
Semantics for reciprocal preferences	
F. CASTIBLANCO, C. FRANCO, J. T. RODRÍGUEZ, J. MONTERO	59

An Ordered Weighted Averaging Operator based on Extreme Values Reductions.	
D. GARCÍA-ZAMORA, Á. LABELLA, R. M. RODRÍGUEZ, L. MARTÍNEZ	59
Evolving Fuzzy System Applied to Battery Charge Capacity Prediction for Fault Prognostics	
M. OSORIO CAMARGOS, I. BESSA, L. CORDOVIŁ JUNIOR, P. H. SILVA COUTINHO, D. LEITE, R. MARTÍNEZ PALHARES	60
Incremental Learning and State-Space Evolving Fuzzy Control of Nonlinear Time-Varying Systems with Unknown Model	
D. LEITE, P. COUTINHO, I. BESSA, M. CAMARGOS, L. CORDOVIŁ JUNIOR, R. PALHARES	60
Balancing data within incremental semi-supervised fuzzy clustering for credit card fraud detection	
G. CASALINO, G. CASTELLANO, N. MARVULLI	60
Fuzzifying Geospatial Data to Identify Critical Traffic Areas	
J. PINCAY, E. PORTMANN, L. TERÁN	60
Monitoring acoustic data streams using possibilistic aggregation and multi label learning	
K. KACZMAREK-MAJER, O. HRYNIEWICZ, D. KORNOBIS, A. STACHOWIAK . . .	60
The use of similarity measures in the method of selecting features for classification under uncertainty	
B. PEKALA, K. DYCZKOWSKI, J. SZKOŁA, D. KOSIOR	61
Possibilistic granular count: derivation and extension to granular sum	
C. MENCAR	61
On a graded version of stochastic dominance	
R. PÉREZ-FERNÁNDEZ, J. BAZ, I. DÍAZ, S. MONTES	61
Optimality conditions for multiobjective fuzzy programming problems	
B. HERNÁNDEZ-JIMÉNEZ, R. OSUNA-GÓMEZ, Y. YALCO-CANO, G. RUÍZ-GARZÓN	61
A Minimax Criterion Approach to Treat the Inexactness in Feasible Set of a Linear Programming Problem	
Z. GAO, M. INUIGUCHI	61
Learning of Consistent Preference Relations for Decision Making and Optimization in the Context of Interacting Goals	
R. FELIX	62
How General Is Fuzzy Decision Making?	
O. KOSHELEVA, V. KREINOVICH	62
Why kappa regression?	
J. URENDA, O. CSISZÁR, G. CSISZÁR, J. DOMBI, G. EIGNER, O. KOSHELEVA, V. KREINOVICH	62
In search of a precise estimator based on imprecise data	
P. A. GRZEGORZEWSKI, J. GOŁAWSKA	62
Epistemic bootstrap for fuzzy data	
P. A. GRZEGORZEWSKI, M. ROMANIUK	62
fIRTree: An Item Response Theory modeling of fuzzy rating data	
A. CALCAGNI	62

Interactive Decision Making for Multiobjective Bimatrix Games with Fuzzy Payoffs Based on Possibility Measure H. YANO, I. NISHIZAKI	62
Against Artificial Complexification: Crisp vs. Fuzzy Information in the TOP-SIS Method D. PELTA, M. T. LAMATA, J. L. VERDEGAY, C. CRUZ, A. SALAS	63
Fuzzy equivalences and aggregation functions in decision-making problems U. BENTKOWSKA, A. KRÓL	63
A Granular Consensus Model Based on Intuitionistic Reciprocal Preference Relations and Minimum Adjustment for Multi-Criteria Group Decision Making F. J. CABRERIZO, J. R. TRILLO, J. A. MORENTE-MOLINERA, S. ALONSO, E. HERRERA-VIDEIRA	63
Generalized Peterson's syllogisms with the quantifier "At least several (a few; a little)" P. MURINOVÁ, V. NOVÁK	63
On Modelling of Generalized Peterson's Syllogisms with More Premises K. FIALA, V. ČERVEŇOVÁ, P. MURINOVÁ	63
Generalized Peterson's Rules in Fuzzy Natural Logic P. MURINOVÁ, V. PAVLISKA, M. BURDA	64
An Overview of Graded Structures of Opposition with Intermediate Quantifiers P. MURINOVÁ	64
Qualitative capacities and their informational comparison D. DUBOIS, F. FRANCIS, H. PRADE, A. RICO	64
A fuzzy order for graphs based on the continuous entropy of Gaussian Markov Random Fields J. BAZ, I. DÍAZ, S. MONTES, R. PÉREZ-FERNÁNDEZ	64
Conditional interval valued probability and martingale convergence theorem K. ČUNDERLÍKOVÁ	64
Quantile based summation of random variables K. EMIR, D. KRUML, J. PASEKA, I. SELINGEROVÁ	64
Some categorical equivalences for Nelson algebras with consistency operators F. ESTEVA, A. FIGALLO-ORELLANO, T. FLAMINIO, L. GODO	64
Propositional Dynamic Logic over Finite Łukasiewicz Chains I. SEDLÁR	65
Approaching the square of oppositions in terms of the f-indexes of inclusion and contradiction N. MADRID, M. OJEDA-ACIEGO	65
On Preservation of Residuated Lattice Properties for Partial Algebras N. CAO, M. ŠTĚPNIČKA	65
A comparative study of LDA and FLSA for Violence Risk Assessment E. RIJCKEN, U. KAYMAK, K. ZERVANOU, P. MOSTEIRO, M. SPRUIT, F. SCHEEPERS	65
CG2A: Conceptual Graphs Generation Algorithm A. FACI, M.-J. LESOT, C. LAUDY	66

A Sentiment-Based Author Verification Model Against Social Media Fraud K. HAMMOUD, S. BENBERNOU, M. OUZIRI	66
Data Fusion in Question Answering Systems over Multiple-Knowledge Bases N. D. TO, M. Z. REFORMAT	66
Classification Method of Image Feature Matching Using Naive Bayes Classifier J. Y. KIM, E. K. KIM, B. KIM, D. HA, S. KIM	66
Distance transformations based on aggregation functions S. IGLESIAS-REY, B. DE BAETS, C. LOPEZ-MOLINA	66
Feature-based identification of Tau protein in neural tissue F. ANTUNES-SANTOS, C. LOPEZ-MOLINA, M. IRIARTE, B. DE BAETS	67
Some Approaches Based on Interval-Valued Images and $\mathbb{L}$-Fuzzy Mathematical Morphology for Segmenting Images Reconstructed from Noisy Sino-grams P. SUSSNER, L. CORBACHO CARAZAS, E. MIQUELES	67
Triangular Fuzzy Relational Products of Level Fuzzy Relations N. CAO, M. BURDA	67
Sup-T Compositions of Partial Fuzzy Relations L. BĚHOUNEK, M. DAŇKOVÁ	68
Consistency in Deducing Redundant Linguistic Fuzzy Rules N. CAO, R. VALÁŠEK	68
Fuzzy Metrics for Solving MODM Problems O. GRIGORENKO	68
On the use of computational perceptions as labeled datasets in machine learning: a first empirical approximation C. RUBIO-MANZANO, T. LERMANDA, C. MARTÍNEZ-ARANEDA, A. SEGURA-NAVARRETE, C. VIDAL-CASTRO	68
A Semi-Supervised Anomaly Detection Approach in Brain MRI Images including Alzheimer's Disease J.-B. KIM, N. CHAUHAN, B.-J. CHOI	68
Multiple Criteria Decision Analysis Based on Ill-known Pairwise Comparison Data M. INUIGUCHI, S. INNAN	68
From MCDA to Fuzzy MCDA: Fuzzy Extensions of an MCDA Method and Their Distinctions A. RADAEV, A. KORBOV, B. YATSALO, L. MARTÍNEZ	69
Measuring the environmental cost in the evaluation of metaheuristics P. NOVOA-HERNÁNDEZ, A. PURIS, D. PELTA	70
A Comparative Analysis based on GIS and Fuzzy MCDM Approaches. Case Study: Offshore Wind Site Selection in the Gulf of Maine J. M. SÁNCHEZ-LOZANO, A. RAMOS ESCUDERO, I. C. GIL-GARCÍA, M. S. GARCÍA-CASCALES, Á. MOLINA-GARCÍA	70
A Case Study of AutoML for Supervised Crash Severity Prediction J. S. ANGARITA-ZAPATA, G. MAESTRE-GONGORA, J. FAJARDO CALDERÍN . . .	70

A methodology for more sustainable agriculture through early crop frost forecasting	
J. M. CADENAS, M. C. GARRIDO, R. MARTÍNEZ ESPAÑA	70
Abstracts of AGOP	73
Aggregation based on outliers	
A. KOLESÁROVÁ, R. MESIAR	75
Continuous OWA operators	
M. KALINA	75
On some generalizations of homogeneity of aggregation functions	
A. STUPŇANOVÁ, Y. SU	75
New Classes of the Moderate Deviation Functions	
J. ŠPIRKOVÁ, H. BUSTINCE, F. J. FERNANDEZ, M. SESMA-SARA	75
Some remarks on convolution of collection integrals	
A. ŠELIGA	75
Expectation quadruplet based on fuzzy integrals	
Z. ONTKOVIČOVÁ, J. KISELÁK	75
Generalization of interval-valued Sugeno integral	
Ľ. HORANSKÁ, Z. TAKÁČ, H. BUSTINCE	75
General Admissibly Ordered Interval-valued Overlap Functions	
T. ASMUS, G. DIMURO, J. A. SANZ, J. WIECZYNSKI, G. LUCCA, E. BORGES, H. BUSTINCE	76
On some functional equations related to alpha migrative t-conorms	
K. MIŚ, M. BACZYŃSKI	76
A generalization of power-based implications	
M. BACZYŃSKI, W. FECHNER, S. MASSANET	76
An analysis of the invariance property with respect to powers of nilpotent t-norms on fuzzy implication functions	
R. FERNANDEZ-PERALTA, S. MASSANET, A. MIR	77
On the preservation of some additional properties via the quadratic polynomial construction method of fuzzy implication functions	
I. AGUILÓ, S. MASSANET, J. V. RIERA	77
New results on discrete implication functions	
S. MASSANET, M. MUNAR, D. RUIZ-AGUILERA	78
Fuzzy Relations and Monometrics: Some Correspondences	
M. GUPTA, B. JAYARAM	78
An overview of honeycomb-based graph aggregation functions.	
G. MOŚ	78
Extreme points of polytopes of discrete copulas	
E. PERRONE, F. DURANTE	79
On a construction method of trivariate copulas	
C. IGNAZZI, F. DURANTE	79
The Borda Count as an initial threshold for Kemeny ranking aggregation	
N. RICO, C. RODRÍGUEZ-VELA, R. PÉREZ-FERNÁNDEZ, I. DÍAZ	79

Combining classifiers with the interval-valued Choquet integral	
Z. TAKÁČ, M. URIZ, M. GALAR, D. PATERNAIN, H. BUSTINCE	79
Aggregation and pre-aggregation functions in optimization problems of ensemble classifiers	
U. BENTKOWSKA, W. GAŁKA, M. MRUKOWICZ	79
Affinity Functions and Centrality Measures in Social Network Analysis	
J. FUMANAL IDOCIN, M. MINÁROVÁ, F. J. FERNANDEZ, O. CORDÓN, H. BUSTINCE	80
Applicability of ordinal sums of conjunctive and disjunctive functions in classification	
M. HUDEC, R. MESIAR, E. MINÁRIKOVÁ	81
Construction of commutative, associative functions via z-ordinal sum construction	
A. MESIAROVÁ-ZEMÁNKOVÁ	81
On DU-ordinal sums of partially ordered monoids	
M. HOLČAPEK, A. DVOŘÁK, J. PASEKA	81
Inf- and sup-preserving aggregation functions	
M. CARDIN	81
Empirical monotonicity of Non-deterministic Computable Aggregations	
L. GARMENDIA, D. GÓMEZ, L. MAGDALENA, J. MONTERO	82
d-XC-integrals: On the generalization of the expanded form of the Choquet integral by restricted dissimilarity functions	
J. WIECZYNSKI, G. LUCCA, E. BORGES, T. ASMUS, L. EMMENDORFER, H. BUSTINCE, G. DIMURO	82
On a special class of interval-valued fuzzy operators	
P. DRYGAŚ	83
Orders from Uninorms on Bounded Lattices: Some Perspectives	
V. K. GUPTA, B. JAYARAM	83
Order based on Non-Associative Operations	
K. NANAVATI, B. JAYARAM	83
Some investigations on t-norms and t-conorms on an appropriate bounded lattice	
E. AŞICI	83
Some conclusions on the direct product of uninorms on bounded lattices	
E. AŞICI, R. MESIAR	83
The Choquet integral in the construction of composite indices: The case of the Society Sustainable Index.	
P. PÉREZ-ASURMENDI, B. LLAMAZARES	83
Choquet integrals with respect to generalized survival functions	
J. BORZOVÁ, L. HALČINOVÁ, J. ŠUPINA	84
Survival functions based on conditional aggregation operators	
S. BASARIK, J. BORZOVÁ, L. HALČINOVÁ	84
On a generalization of level measures	
M. BOCZEK, O. HUTNÍK, M. KALUSZKA, M. KLEINOVÁ	85

On agglomerative hierarchical percentile clustering	
F. DURANTE, A. GATTO, S. SAMINGER-PLATZ	85
Cosmological Clustering: A gravitational clustering approach inspired on large-scale cosmos' structure and dynamics	
A. CASTILLO-LÓPEZ, M. MINÁROVÁ, I. RODRÍGUEZ-MARTÍNEZ, J. FUMANAL IDOCIN, H. BUSTINCE	85
Aggregation of operators in fuzzy relational mathematical morphology: erosion and dilation	
A. ŠOSTAK, I. ULJANE	85
Aggregation operators for comparative possibility distributions and their role in group decision making	
A. ZUBYUK, E. FADEEV	86
Abstracts of FQAS	87
Flexible Querying using Disjunctive Concepts	
G. SMITS, M.-J. LESOT, O. PIVERT, R. YAGER	89
Analytical Queries on Vanilla RDF Graphs with a Guided Query Builder Approach	
S. FERRE	89
Dealing with Data Veracity in Multiple Criteria Handling: An LSP-based approach	
G. DE TRÉ, J. DUJMOVIC	89
Realization of a Natural Logic in a Database System	
T. ANDREASEN, H. BULSKOV, J. FISCHER NILSSON	89
Generalized Weighted Repairs	
H. TELLEZ PEREZ, J. WIJSEN	89
Detecting ESG Topics Using Domain-Specific Language Models and Data Augmentation	
T. NUGENT, N. STELEA, J. L. LEIDNER	89
A Novel Approach for Supporting Italian Satire Detection through Deep Learning	
A. CUZZOCREA, G. LO BOSCO, M. MAIORANA, G. PILATO, D. SCHICCHI, G. CASALINO	89
DocTalk: Combining Dependency-based Text Graphs and Deep Learning into a Practical Dialog Engine	
Y. GUO, W. SUN, A. KHAN, T. DOAN, P. TARAU	90
A comparative study of word embeddings for the construction of a social media expert filter	
J. A. DIAZ-GARCIA, M. D. RUIZ, M. J. MARTIN-BAUTISTA	90
J-CO, a Framework for Fuzzy Querying Collections of JSON Documents (Demo)	
P. FOSCI, G. PSAILA	90
Abstracts of IJCRS	91
Possibility Distributions Generated by Intuitionistic L-Fuzzy Sets	
S. BOFFA, D. CIUCCI	93

Adapting fuzzy rough sets for classification with missing values	
O. U. LENZ, D. PERALTA, C. CORNELIS	93
Possible Coverings in Incomplete Information Tables with Similarity of Values	
M. NAKATA, N. SAITO, H. SAKAI, T. FUJIWARA	93
Fuzzy-Rough Nearest Neighbour Approaches for Emotion Detection in Tweets	
O. KAMINSKA, C. CORNELIS, V. HOSTE	93
Many-Valued Dynamic Object-Oriented Inheritance and Approximations	
A. SZALAS	93
Feature Reduction and Disambiguation in Learning from Fuzzy Labels using Rough Sets	
A. CAMPAGNER, D. CIUCCI	93
Knowledge Graph Representation Learning for Link Prediction with Three-Way Decisions	
Z. PENG, H. YU, X. FENG	93
The Influence of Fuzzy Expectations on Triples of Triangular Norms in the Weighted Fuzzy Petri Net for the Subject Area of Passenger Transport Logistics	
Y. BLOSHKO, Z. SURAJ, O. OLAR	94
Right adjoint algebras versus operator left residuated posets	
M. E. CORNEJO, J. MEDINA	94
Revisiting impact of local congruences in variable selection from datasets	
R. G. ARAGÓN, J. MEDINA, E. RAMÍREZ POUSSA	94
Bipolar max-product fuzzy relation equations with the standard negation	
M. E. CORNEJO, D. LOBO, J. MEDINA	94
Relation-based fuzzy granular approximations	
M. PALANGETIĆ, C. CORNELIS, S. GRECO, R. SŁOWIŃSKI	94
The RSDS – a Tool for Users of Rough Sets and Related Domains	
Z. SURAJ, P. GROCHOWALSKI	95
PNeS in Modelling, Control and Analysis of Concurrent Systems	
Z. SURAJ, P. GROCHOWALSKI	95
3RD: A multi-criteria decision-making method based on three-way rankings	
Y. YAO, C. SHI	95
Minimizing Depth of Decision Trees with Hypotheses	
M. AZAD, I. CHIKALOV, S. HUSSAIN, M. MOSHKOV	95
Attention Enhanced Hierarchical Feature Representation for Three-way Decision Boundary Processing	
J. CHEN, Y. CHEN, Y. XU, S. ZHAO, Y. ZHANG	95
Three-way decisions based RNN models for sentiment classification	
Y. MA, J. YU, B. JI, J. CHEN, S. ZHAO, J. CHEN	95
Spark accelerated implementation of parallel attribute reduction from incomplete data	
Q. CAO, C. LUO, T. LI, H. CHEN	96
An Opinion Summarization-Evaluation System Based on Pre-trained Models	
H. JIANG, Y. WANG, S. LV, Z. WEI	96

General Rough Modeling of Cluster Analysis	
A. MANI	96
Determining Tanimoto Similarity Neighborhoods of Real-Valued Vectors by Means of the Triangle Inequality and Bounds on Lengths	
M. KRYSZKIEWICZ	96
DDAE-GAN: Seismic data denoising by integrating autoencoder and generative adversarial network	
F. MIN, L.-R. WANG, S.-L. PAN, G.-J. SONG	96
Attribute Reduction Using Functional Dependency Relations in Rough Set Theory	
M. RESTREPO, C. CORNELIS	97
Tolerance-based Twitter Sentiment Classifier: Preliminary Results	
V. PATEL, S. RAMANNA	97
Mining Incomplete Data Using Global and Saturated Probabilistic Approximations Based on Characteristic Sets and Maximal Consistent Blocks	
P. CLARK, J. GRZYMALA-BUSSE, Z. S. HIPPE, T. MROCZEK	97
Author index	99