# **Advances in Intelligent Systems and Computing**

Volume 643

### Series editor

Janusz Kacprzyk, Polish Academy of Sciences, Warsaw, Poland

e-mail: kacprzyk@ibspan.waw.pl

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# Advances in Fuzzy Logic and Technology 2017

Proceedings of: EUSFLAT-2017 – The 10th Conference of the European Society for Fuzzy Logic and Technology, September 11–15, 2017, Warsaw, Poland IWIFSGN'2017 – The Sixteenth International Workshop on Intuitionistic Fuzzy Sets and Generalized Nets, September 13–15, 2017, Warsaw, Poland, Volume 3



Editors

Janusz Kacprzyk

Systems Research Institute Polish Academy of Sciences

Warsaw Poland

Eulalia Szmidt

Systems Research Institute Polish Academy of Sciences

Warsaw Poland

Slawomir Zadrożny Systems Research Institute Polish Academy of Sciences

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Bulgaria

Maciej Krawczak

WIT - Warsaw School of Information

Technology

Warsaw Poland

and

Systems Research Institute Polish Academy of Sciences

Warsaw Poland

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## **Foreword**

This volume constitutes the proceedings of the two collocated international conferences. The main part includes the papers accepted, after a strict peer review process, for the presentation at, and for the inclusion in the proceedings of the 10th Conference of the European Society for Fuzzy Logic and Technology (EUSFLAT-2017) held in Warsaw, Poland, on September 11–15, 2017. It is combined with the papers accepted, also after a strict peer review process, for the presentation at, and for the inclusion in the proceedings of the Sixteenth International Workshop on Intuitionistic Fuzzy Sets and Generalized Nets (IWIFSGN'2017) held in Warsaw, Poland, on September 13–15, 2017.

The EUSFLAT-2017 Conference was organized by the Systems Research Institute, Polish Academy of Science, Department IV of Engineering Sciences, Polish Academy of Sciences, and the Polish Operational and Systems Research Society. It is the 10th jubilee edition of the flagship conference of the European Society for Fuzzy Logic and Technology (EUSFLAT). The aim of the conference, in line with the mission of the EUSFLAT Society, is to bring together theoreticians and practitioners working on fuzzy logic, fuzzy systems, soft computing, and related areas and to provide for them a platform for the exchange of ideas, discussing newest trends and networking.

The papers included in the proceedings volume have been subject to a thorough review process by highly qualified peer reviewers. Comments and suggestion from them have considerably helped improve the quality of the papers but also the assignment of the papers to best suited sessions in the conference program. In the proceedings volume, the papers have been ordered alphabetically with respect to the name of the first author, and a convenient author's index is included at the end of the volume.

Thanks are due to many people and parties involved. First, in the early stage of the preparation of the conference general perspective, scope, topics, and coverage, we have received an invaluable help from the members of the International Committees of both conferences, notably the chairs responsible for various aspects of the conferences, as well as many people from the European Society for Fuzzy Logic and Technology (EUSFLAT). That help during the initial planning stage had

vi Foreword

resulted in a very attractive and up-to-date proposal of the scope and coverage that had clearly implied a considerable interest of the international research communities active in the areas covered who submitted a large number of very interesting and high-level papers. An extremely relevant role of the organizers of special sessions, competition, and other events should also be greatly appreciated. Thanks to their vision and hard work, we had been able to collect many papers on focused topics which had then resulted, during the conferences, in very interesting presentations and stimulating discussions at the sessions.

Though EUSFLAT-2017 is a subsequent edition of the main European conference on the broadly perceived fuzzy logic and technology, and an overwhelming majority of participants come from Europe, many people from other continents have also decided to submit their contributions. This has clearly resulted in a "globalization" of the EUSFLAT conferences which we have been able to increasingly notice since its founding. Of a particular importance in this respect is that among the plenary and keynote speakers, there are top researchers and scholars, as well as practitioners, not only from Europe but also from other continents.

The members of the Program Committee, together with the session organizers, and a group of other anonymous peer reviewers have undertaken a very difficult task of selecting the best papers, and they have done it excellently. They deserve many thanks for their great job for the entire community who is always concerned with quality and integrity. We also wish to thank the members of the EUSFLAT Board for their support throughout the organization process.

At the stage of the running of the conference, many thanks are due to the members of the Organizing Committee, chaired by Ms. Krystyna Warzywoda and Ms. Agnieszka Jóźwiak, and supported by their numerous collaborators.

And last but not least, we wish to thank Dr. Tom Ditzinger, Dr. Leontina di Cecco, and Mr. Holger Schaepe for their dedication and help to implement and finish this large publication project on time maintaining the highest publication standards.

June 2017 The Editors

## **Contents**

Processes and Noise Reduction	]
Sheffer Stroke Fuzzy Implications	13
Towards Fuzzy Type Theory with Partial Functions	25
Dynamic Intuitionistic Fuzzy Evaluation of Entrepreneurial Support in Countries	38
Hesitant Fuzzy Evaluation of System Requirements in Job Matching Platform Design	48
An Interval Valued Hesitant Fuzzy Clustering Approach for Location Clustering and Customer Segmentation	50
Aggregation of Risk Level Assessments Based on Fuzzy Equivalence Relation	71
Six Sigma Project Selection Using Interval Neutrosophic TOPSIS irem Otay and Cengiz Kahraman	83
Integrated Call Center Performance Measurement Using Hierarchical Intuitionistic Fuzzy Axiomatic Design	94

viii Contents

Prioritization of Business Analytics Projects Using Interval Type-2 Fuzzy AHP	106
Basar Oztaysi, Sezi Cevik Onar, and Cengiz Kahraman	
Optimized Fuzzy Transform for Image Compression	118
Fuzzy Decision Matrices in Case of a Discrete Underlying Fuzzy Probability Measure.  Ondřej Pavlačka and Pavla Rotterová	129
Compositions Consistent with the Modus Ponens Property Used in Approximate Reasoning	138
General Preference Structure with Uncertainty Data Present by Interval-Valued Fuzzy Relation and Used in Decision Making Model	150
Comparative Study of Type-1 and Interval Type-2 Fuzzy Systems in the Fuzzy Harmony Search Algorithm Applied to Benchmark Functions.  Cinthia Peraza, Fevrier Valdez, and Oscar Castillo	162
Penalty-Based Aggregation Beyond the Current Confinement to Real Numbers: The Method of Kemeny Revisited	171
Is Fuzzy Number the Right Result of Arithmetic Operations on Fuzzy Numbers?  Andrzej Piegat and Marek Landowski	181
Analysis of Different Proposals to Improve the Dissemination of Information in University Digital Libraries	195
Modeling Trends in the Hierarchical Fuzzy System for Multi-criteria Evaluation of Medical Data  Piotr Prokopowicz, Dariusz Mikołajewski, Emilia Mikołajewska, and Krzysztof Tyburek	207
Using Fuzzy Sets in a Data-to-Text System for Business Service Intelligence A. Ramos-Soto, J. Janeiro, J.M. Alonso, A. Bugarin, and D. Berea-Cabaleiro	220

Contents ix

An Approach to Fault Diagnosis Using Fuzzy Clustering Techniques Adrián Rodríguez Ramos, José Manuel Bernal de Lázaro, Antônio J. da Silva Neto, Carlos Cruz Corona, José Luís Verdegay, and Orestes Llanes-Santiago	232
Universal Generalized Net Model for Description of Metaheuristic Algorithms: Verification with the Bat Algorithm Olympia Roeva and Vassia Atanassova	244
Insurance Portfolio Containing a Catastrophe Bond and an External Help with Imprecise Level—A Numerical Analysis	256
Global Quality Measures for Fuzzy Association Rule Bases	268
Particle Swarm Optimization with Fuzzy Dynamic Parameters Adaptation for Modular Granular Neural Networks Daniela Sánchez, Patricia Melin, and Oscar Castillo	277
A Systematic Customer Oriented Approach based on Hesitant Fuzzy AHP for Performance Assessments of Service Departments Ozlem Senvar	289
Edge Detection Based on Ordered Directionally Monotone Functions  Mikel Sesma-Sara, Humberto Bustince, Edurne Barrenechea, Julio Lafuente, Anna Kolsesárová, and Radko Mesiar	301
Adaptive Fuzzy Clustering of Multivariate Short Time Series with Unevenly Distributed Observations Based on Matrix Neuro-Fuzzy Self-organizing Network	308
Learning in Comparator Networks	316
Fuzzy $\varphi$ -pseudometrics and Fuzzy $\varphi$ -pseudometric Spaces Alexander Šostak and Raivis Bēts	328
Generalized Net Modelling of the Intuitionistic Fuzzy Evaluation of the Quality Assurance in Universities	341
How to Calibrate a Questionnaire for Risk Measurement?  Jana Špirková and Pavol Král'	348

x Contents

Diagnostic Inference with the Dempster-Shafer Theory and a Fuzzy Input.	361
Ewa Straszecka	001
Analyzing Feedback Mechanisms in Group Decision  Making Problems	371
Atefeh Taghavi, Esfandiar Eslami, Francisco Javier Cabrerizo, and Enrique Herrera-Viedma	
A Statistical Study for Quantifier-Guided Dominance and Non-Dominance Degrees for the Selection of Alternatives in Group Decision Making Problems.  J.M. Tapia, M.J. del Moral, S. Alonso, and E. Herrera-Viedma	383
Using Bibliometrics and Fuzzy Linguistic Modeling to Deal with Cold Start in Recommender Systems for Digital Libraries	393
Type 2 Fuzzy Control Charts Using Likelihood and Deffuzzification Methods	405
Linked Open Data: Uncertainty in Equivalence of Properties Nhuan D. To, Marek Z. Reformat, and Ronald R. Yager	418
Power Means in Success Likelihood Index Method	430
Three Dimensional Intercriteria Analysis over Intuitionistic	
Fuzzy Data	442
M-bornologies on L-valued Sets	450
Reduced IFAM Weight Matrix Representation Using Sparse Matrices	463
A Note on Intuitionistic Fuzzy Modal-Like Operators Generated by Power Mean	470
On Power Mean Generated Orderings Between Intuitionistic	
Fuzzy Pairs	476
Peter Vassilev and Todor Stoyanov	

Contents xi

<b>Dynamical Behaviors of Fuzzy SIR Epidemic Model</b>	482
Optimal Parameter Ranges in Fuzzy Inference Systems, Applied to Spatial Data	493
On Finite-Valued Bimodal Logics with an Application to Reasoning About Preferences	505
Improving Supervised Classification Algorithms by a Bipolar Knowledge Representation	518
Edge Detection Based on the Fusion of Multiscale Anisotropic Edge Strength Measurements	530
Fuzzy MCDA Without Defuzzification Based on Fuzzy Rank Acceptability Analysis Boris Yatsalo and Luis Martinez	537
A Portfolio of Minimum Risk in a Hybrid Uncertainty of a Possibilistic-Probabilistic Type: Comparative Study	551
Discrete Wavelet Transform and Fuzzy Logic Algorithm for Classification of Fault Type in Underground Cable Suntiti Yoomak, Chaichan Pothisarn, Chaiyan Jettanasen, and Atthapol Ngaopitakkul	564
Investigation and Reduction of Effects of Transient Signals for Switching Capacitor into a Power System by Using an Experimental Test Set  Suntiti Yoomak, Chaichan Pothisarn, Chaiyan Jettanasen, and Atthapol Ngaopitakkul	574
Practical Notes on Applying Generalised Stochastic Orderings to the Study of Performance of Classification Algorithms for Low Quality Data  Patryk Żywica, Katarzyna Basiukajc, and Inés Couso	586
Author Index	601