

**19th International Conference on Information Processing and Management of
Uncertainty in Knowledge-Based Systems – IPMU 2022**
Milan, Italy, July 11th – 15th 2022

Monday, 11 July

09:00 **Opening**

09:30 **Keynote talk: Tomaso Poggio, “Science and Engineering of Intelligence”**

Chairperson: Bernadette Bouchon-Meunier

Room: Aula Magna

11:15 Coffee break

11:45 **Parallel sessions**

Interval Uncertainty 1

Chairperson: Martine Ceberio, Vladik Kreinovich

Room: 01/A

Olga Kosheleva and Vladik Kreinovich

Why People Tend to Overestimate Joint Probabilities

Eulalia Szmidt and Janusz Kacprzyk

Atanassov's Intuitionistic Fuzzy Sets Demystified

Pedro Huidobro, Noelia Rico, Agustina Bouchet, Susana Montes and Irene Díaz

A new similarity measure for real intervals to solve the aliasing problem

Information Fusion Techniques based on Aggregation Functions, Pre-aggregation Functions, and their Generalizations 1

Chairperson: Javier Fernandez

Room: 01/B

Guilherme Bayer Schneider, Bruno Moura, Eduardo Monks, Helida Santos, Adenauer Yamin and Renata Reiser

Int-FLBCC: Exploring Fuzzy Consensus Measures via Penalty Functions

[a] Iosu Rodriguez-Martinez, Pablo Aitor Lizarraga-Guerra, Tiago Asmus, Graçaliz Dimuro, Francisco Herrera and Humberto Bustince

Penalty-based pooling functions for feature reduction on Convolutional Neural Networks

Soft Methods in Statistics and Data Analysis 1

Chairperson: Przemyslaw Grzegorzewski

Room: 01/F

Ramón Christen, Luca Mazzola, Alexander Denzler and Edy Portmann

Distance Metrics for Evaluating the Use of Exogenous Data in Load Forecasting

[a]¹ Gloria Bordogna, Diego Breviario and Luca Frigerio
Soft Computing to Aid Biologists Recognize Material Components in Food Products

12:45 Lunch

14:15 **Parallel sessions**

Generalized Sets and Operators

Chairperson: Michal Holcapek

Room: 01/A

Barbara Pękala, Krzysztof Dyczkowski, Jarosław Szkoła and Dawid Kosior
Selection of relevant features based on optimistic and pessimistic similarities measures of interval-valued fuzzy sets

Jiří Močkoř
Applications of monads in semiring-valued fuzzy sets

Ryszard Janicki
Similarity for Multisets and Heterogeneous Sets

Christophe Marsala
Attribute Ranking with Bipolar Information

Information Fusion Techniques based on Aggregation Functions, Pre-aggregation Functions, and their Generalizations 2

Chairperson: Humberto Bustince

Room: 01/B

Grzegorz Moś
Honeycomb-based polygonal chains aggregation functions

Isabel Aguiló, Sebastia Massanet and Juan Vicente Riera
On rational aggregation functions

Graçaliz Dimuro, Tiago C. Asmus, Jocivania Pinheiro, Helida Santos, Eduardo Borges, Giancarlo Lucca, Iosu Rodriguez-Martinez, Radko Mesiar and Humberto Bustince
On Construction Methods of (interval-valued) General Grouping Functions

Clara Simon de Blas, Juan Antonio Guevara, Jaime Morillo Leal and Daniel Gomez Gonzalez
Polarization measures in bi-partition networks based on Fuzzy graphs

Paweł Drygaś and Krzysztof Balicki
Parameterized pre-aggregation function with interval values in medical decisions making

Juscelino Araújo, Benjamin Bedregal and Regivan Santiago
Fuzzy-valued distance between fuzzy numbers based on a generalized extension principle

Soft Methods in Statistics and Data Analysis 2

Chairperson: Przemysław Grzegorzewski

Room: 01/F

¹ [a] = the paper can be found in the book of abstracts.

Corrado Mencar and Didier Dubois
Connections between granular counts and twofold fuzzy sets

Antonio Calcagni and Luigi Lombardi
A probabilistic tree model to analyze fuzzy rating data

Przemyslaw Grzegorzewski
Testing Independence with Fuzzy Data

Raúl Pérez-Fernández and Juan Baz
On the role of the considered measure in a quantile-based graded version of stochastic dominance

Przemyslaw Grzegorzewski and Maciej Romaniuk
Bootstrapped Kolmogorov-Smirnov Test for Epistemic Fuzzy Data

Aziz Omar, Timo von Oertzen and Thomas Augustin
Learning from categorical data subject to non-random misclassification and non-response under prior quasi-near-ignorance using an imprecise Dirichlet model

16:15 Coffee break

16:45 **Parallel sessions**

Fuzzy Mathematical Analysis and its Applications 1

Chairperson: Beatriz Hernández Jiménez

Room: 01/F

Irina Perfilieva and Tam Pham
CI Approach to Numerical Methods for Solving Fuzzy Integral Equations

Juan Carlos Blanche-Alcócer and Yurilev Chalco-Cano
A characterization for generalized Hukuhara differentiable interval-valued functions and some rules of calculus

M^a Beatriz Hernández Jiménez, Rafaela Osuna-Gómez, Yurilev Chalco-Cano and Tiago M. da Costa
A review on differentiability and optimality conditions in fuzzy environments

[a] Rosana Rodríguez-López
Fuzzy differential equations: on some connections between solutions from different perspectives

Interval Uncertainty 2

Chairperson: Martine Ceberio, Vladik Kreinovich

Room: 01/A

Sébastien Destercke and Romain Guillaume,
Necessary and possibly optimal items in selecting problems

Makenzie Spurling, Chenyi Hu, Huixin Zhan and Victor Sheng
Anomaly detection in crowdsourced work with interval-valued labels

Aaron Moody, Chenyi Hu, Huixin Zhan, Makenzie Spurling and Victor Sheng
Towards explainable summary of online reviews through text mining

[a] Olga Kosheleva and Vladik Kreinovich
What If There Are Too Many Outliers

Information Fusion Techniques based on Aggregation Functions, Pre-aggregation Functions, and their Generalizations 3

Chairperson: Graçaliz Pereira Dimuro
Room: 01/B

Miroslav Hudec, Erika Mináriková and Radko Mesiar
Aggregation Functions in Flexible Classification by Ordinal Sums

Michal Holcapek and Viec Bui Quoc
On an application of integral transforms for lattice-valued functions in image processing

[a] Mikel Ferrero-Jaurrieta, Zdenko Takáč, Ľubomíra Horanská, Graçaliz Pereira Dimuro, Javier Fernandez and Humberto Bustince
Vectorial extensions of Fuzzy Integrals on sequential information fusion

[a] Jonata Wieczynski, Giancarlo Lucca, Eduardo Borges, Mikel Ferrero-Jaurrieta, Tiago Asmus, Graçaliz Dimuro and Humberto Bustince
Application of the Sugeno Integral in Fuzzy Rule Based Classification

19:00 Welcome reception

Tuesday, 12 July

09:00 **Keynote talk: César A. Hidalgo, “How Humans Judge Machine”**
Chairperson: Inés Couso
Room: Aula Magna

10:30 coffee break

11:00 **Parallel sessions**
Uncertainty, Heterogeneity, Reliability and Explainability in AI 1
Chairperson: Salem Benferhat
Room: 01/A

Hakim Radja, Yassine Djouadi and Karim Tabia
Towards an FCA-based approach for explaining multi-label classification

Gabriele Gianini, Jianyi Lin, Corrado Mio and Ernesto Damiani
Set-based counterfactuals in partial classification

Fares Grina, Zied Elouedi and Eric Lefevre
Evidential Hybrid re-Sampling for Multi-Class imbalanced data

Sara Kebir and Karim Tabia
Classifier probability calibration through uncertain information revision

[a] Lianmeng Jiao, Haoyu Yang and Quan Pan
DT-EVCLUS: Decision Tree-based Evidential Clustering

Fuzzy Implication Functions

Chairperson: Balasubramaniam Jayaram

Room: 01/B

Kavit Nanavati, Megha Gupta and Balasubramaniam Jayaram

Monodistances from Fuzzy Implications

Michal Baczynski, Raquel Fernandez-Peralta, Sebastia Massanet, Arnau Mir and Juan Vicente Riera

On the additional properties of fuzzy polynomial implications of degree 4

Mateusz Pieszczyk and Michal Baczynski

Preservation of the ordering property under the quadratic polynomial construction of fuzzy implication functions

Fernando Neres, Benjamín Bedregal and Regivan Santiago

On a new contrapositivation technique for fuzzy implications constructed from triangular conorms

Katarzyna Miś

Construction of fuzzy implications from the Bandler-Kohout subproduct

Decision Making Modeling and Applications 1

Chairperson: Rocío De Andrés Calle

Room: 01/F

Jacky Montmain, Abdelhak Imoussaten, Sebastien Harispe and Pierre-Antoine Jean

On the notion of influence in sensory analysis

Luis Crespo, Tony Slaba, Floriane Poignant and Sean Kenny

Model Calibration for Cancer Risk Projections According to Uncertain Data

Swati Sachan

Fintech Lending Decisions: An Interpretable Knowledge-Base System for Retail and Commercial Loans

Esra Çakir, Mehmet Ali Taş and Emre Demircioğlu

Intuitionistic Fuzzy Selected Element Reduction Approach (IF-SERA) on Service Quality Evaluation of Digital Suppliers

Juan Miguel Sánchez-Lozano, Manuel Fernández-Martinez, Marcelino Cabrera-Cuevas and David Pelta

Intervals and possibility degree formulae for usage prioritization of Cartagena coastal military batteries

12:45 Lunch

14:15 **Parallel sessions**

Uncertainty, Heterogeneity, Reliability and Explainability in AI 2

Chairperson: Marie-Jeanne Lesot

Room: 01/A

Pietro Portolani, Alessandro Brusafferri, Andrea Ballarino and Matteo Matteucci

Uncertainty in Predictive Process Monitoring

Guy De Tre, Milan Peelman and Jozo Dujmovic
Logic Operators and Sibling Aggregators for Z-grades

Sihem Belabbes and Salem Benferhat
Characterizing the Possibilistic Repair for Inconsistent Partially Ordered Assertions

Tommaso Flaminio, Angelo Gilio, Lluís Godo and Giuseppe Sanfilippo
Canonical extensions of conditional probabilities and compound conditionals

Serena Doria
Coherent upper conditional previsions with respect to outer Hausdorff measures and the mathematical representation of the selective attention

Amel Hidouri, Said Jabbour, Badran Raddaoui, Mouna Chebbah and Boutheina Ben Yaghlane
A Parallel SAT-based Framework for Mining High Utility Itemsets

Formal Concept Analysis and Uncertainty 1

Chairperson: Manuel Ojeda-Aciego

Room: 01/B

Manuel Ojeda-Hernandez, Inma P. Cabrera, Pablo Cordero and Emilio Muñoz-Velasco
Relational extension of fuzzy structures

Inma P. Cabrera, Pablo Cordero, Emilio Muñoz-Velasco, Manuel Ojeda-Aciego and Bernard De Baets
On the definition of fuzzy relational Galois connections between fuzzy transitive digraphs

David Lobo, Víctor López-Marchante and Jesús Medina
On the effects of conjunctions in the solution set of fuzzy relation equations

Juan Carlos Díaz-Moreno, Daniel Alfonso-Robaina, Annette Malleuve, Jesús Medina and Clemente Rubio-Manzano
Determining cause-effect relations from fuzzy relation equations

[a] M. Eugenia Cornejo Piñero, David Lobo and Jesús Medina
A bipolar approach to solve general optimization problems subject to fuzzy relation equations

Decision Making Modeling and Applications 2

Chairperson: Davide Pelta

Room: 01/F

Juan Baz González, Diego García Zamora, Irene Diaz, Susana Montes and Luis Martínez
Flexible-dimensional EVR-OWA as mean estimator for symmetric distributions

Juan Antonio Guevara, Daniel Gómez, Javier Castro, Inmaculada Gutiérrez and José Manuel Robles
A new approach to Polarization modelling using Markov chains

[a] Irene Mariñas-Collado, Susana Montes-Rodríguez and Agustina Bouchet
An approach to Fuzzy Multi-Objective Shortest Path Problems

[a] Laura Romero, Boris Perez-Cañedo and José Luis Verdegay
Lexicographic Method for Fuzzy Multi-objective Linear Programming

[a] Juan Miguel Sánchez-Lozano and Manuel Fernández-Martínez
A comparative study of fuzzy sets for the assessment of NEA deflection techniques

[a] Hanane El Raoui, David A. Pelta and Marcelino Cabrera
Metaheuristics as solutions producers

16:15 Coffee break

16:45 **Parallel sessions**

Uncertainty, Heterogeneity, Reliability and Explainability in AI 3

Chairperson: Salem Benferhat

Room: 01/A

Petra Kralj Novak, Teresa Scantamburlo, Andraž Pelicon, Matteo Cinelli, Igor Mozetič and Fabiana Zollo
Handling Disagreement in Hate Speech Modelling

Petr Dvořáček and Petr Hurtik
What is the cost of privacy?

Adulam Jeyasothy, Thibault Laugel, Marie-Jeanne Lesot, Christophe Marsala and Marcin Detyniecki
Explanations integrating prior knowledge

Gregory Smits, Marie-Jeanne Lesot, Véronne Yepmo Tchaghe and Olivier Pivert
PANDA : Human-in-the-Loop Anomaly Detection and Explanation

Formal Concept Analysis and Uncertainty 2

Chairperson: Jesús Medina-Moreno

Room: 01/B

Francisco José Valverde Albacete, Carmen Peláez-Moreno, Inma P. Cabrera, Pablo Cordero-Ortega and Manuel Ojeda-Aciego
On Embedding Finite Lattices into the Lattice of Divisibility

[a] Francisco José Ocaña Alcázar, Jesús Medina and María Eugenia Piñero Cornejo
Attribute implications in multi-adjoint concept lattices

[a] Jesús Medina and José Antonio Torné-Zambrano
Towards fuzzy logic programming with generalized quantifiers

Fuzzy Mathematical Analysis and its Applications 2

Chairperson: Beatriz Hernández Jiménez

Room: 01/F

Nhung Cao, Radek Valasek and Martin Stepnicka
On Conflicts of Linguistic Fuzzy Rules

Raivis Bēts, Alexander Šostak and Emīls Miķelis Miķelsons
Parameterized metrics and their applications in word combinatorics

Jiri Kupka
Selected dynamical properties of fuzzy dynamical systems

[a] Zahra Alijani
Solution of Fuzzy Fractional Logistic Differential Equations with Generalized Hukuhara
Differentiability Concept

18:00 [EUSFLAT Meeting, Room 01/B](#)

Wednesday, 13 July

09:00 [Panel session on rough sets](#)
[Chairperson: Dominik Ślęzak](#)
[Room: Aula Magna](#)

10:30 coffee break

11:00 **Parallel sessions**

[Decision Making Modeling and Applications 3](#)

[Chairperson: Shengkun Xie](#)

[Room: 01/F](#)

J. Tinguaro Rodríguez, Camilo Franco De Los Ríos and Javier Montero

Reciprocal Preference-Aversion Structures

Rocio De Andres and Silvia Prieto-Herraez

Stability of preferences over time: Preferences on COVID-19 vaccine from Spanish and French people

Paul Alain Kaldjob, Brice Mayag and Denis Bouyssou

Study of the Instability of the Sign of the Nonadditivity Index in Choquet Integral Model

Brice Mayag and Bertrand Tchantcho

The d-interaction index in MCDA

Shengkun Xie and Jin Zhang

A Novel Variable Selection Approach Based on Multi-criteria Decision Analysis

[Formal Concept Analysis and Uncertainty 3](#)

[Chairperson: Francisco José Valverde-Albacete](#)

[Room: 01/B](#)

Francisco Pérez Gámez, Pablo Cordero, Manuel Enciso, Domingo López-Rodríguez and Ángel Mora

Computing the Mixed Concept Lattice

Fernando Chacón Gómez, Maria Eugenia Cornejo Piñero, Jesús Medina and Eloísa Ramírez Pousa

Fuzzy Rough Set decision algorithms

[a] Alexander Sostak, Ingrīda Uļjane and Māris Krastiņš

On a graded approach to concept lattices in fuzzy rough set theory

María José Benítez-Caballero and Jesús Medina

Generalizing CR-method by means of multi-adjoint formal concept analysis

Roberto G. Aragón, Jesús Medina and Eloisa Ramírez Poussa
Study on the necessity operator to factorize formal contexts in a multi-adjoint framework

Weak and Cautious Learning
Chairperson: Sébastien Destercke
Room: 01/A

Siwar Jendoubi and Aurélien Baelde
SSFuzzyART: a Semi-Supervised Fuzzy ART through seeding initialization

Luciano Sanchez, Nahuel Costa Cortez, David Anseán and Inés Couso
Informed Weak Supervision for battery deterioration level

Andrea Campagner and Davide Ciucci
Rough-set Based Genetic Algorithms for Weakly Supervised Feature Selection

Abdelhak Imoussaten
Choosing the decision hyperparameter for some cautious classifiers

12:45 Lunch

14:15 **Parallel sessions**

Logical Structures of Opposition and Logical Syllogisms
Chairperson: Vilém Novák
Room: 01/A

Vilém Novák and Petra Murinová
Analysis of Peterson's Rules for Syllogisms with Intermediate quantifiers

Petra Murinová and Vilém Novák
On Modeling of Fuzzy Peterson's syllogisms using Peterson's rules

Karel Fiala and Petra Murinová
Modelling of Fuzzy Peterson's syllogisms related to Graded Peterson's Cube of opposition

Stefania Boffa, Davide Ciucci and Petra Murinová
Comparing Hexagons of Opposition in Probabilistic Rough Set Theory

Knowledge Acquisition, Representation and Reasoning 1
Chairperson: Lluís Godó
Room: 01/B

Navid Rezaei, Marek Z. Reformat and Ronald R. Yager
Generating Contextual Weighted Commonsense Knowledge Graphs

Valerio Bellandi, Fulvio Frati, Stefano Siccardi and Filippo Zuccotti
Management of Uncertain Data in Event Graphs

Juan Luis Castro and Manuel Francisco
Similarity Fuzzy Semantic Network for Social Media Analysis

Fuzzy Methods in Data Mining and Knowledge Discovery 1

Chairperson: Carlos Fernandez

Room: 01/F

Patricia Córdoba-Hidalgo, Nicolás Marín and Daniel Sánchez

Flexible Division Queries based on RL-Instances

J. Angel Diaz-Garcia, Carlos Fernandez-Basso, Jesica Gómez-Sánchez, Karel Gutierrez, M. Dolores Ruiz and Maria J. Martin-Bautista

A fuzzy-based approach for cyberbullying analysis

[a] Joseph Onderi Orero and Charles Tijus

Fuzzy gradual rules based approach for assessing car driver's affective states through physiology

Andrea Morales-Garzón, Juan Gómez-Romero and Maria J. Martín-Bautista

Contextual sentence embeddings for obtaining food recipe versions

16:00 Free Time or Guided Tour

20:00 Social Dinner at *Cucina Delle Langhe* restaurant

Thursday, 14 July

09:30 **Keynote talk: Marianne Huchard, "Wake the Concept Lattice in You!"**

Chairperson: Jesús Medina

Room: Aula Magna

11:00 Best paper awards announcement

11:15 coffee break

11:45 **Parallel sessions**

Aggregation Theory beyond the Unit Interval 1

Chairperson: Bernard De Baets

Room: 01/A

Tomasa Calvo and Pilar Fuster-Parra

On the aggregation of n -distances

Raúl Pérez-Fernández and Bernard De Baets

Aggregation on a Cartesian product of bounded partially ordered sets

[a] Marc Munar, Sebastia Massanet and Daniel Ruiz-Aguilera

A study about the cardinality of some connectives defined on finite chains

Knowledge Acquisition, Representation and Reasoning 2

Chairperson: Christophe Marsala

Room: 01/B

Nahla Ben Amor, Didier Dubois, Henri Prade and Syrine Saïdi

Possibilistic preference networks and lexicographic preference trees - A comparison

[a] Gilles Mauris and Laurent Foulloy

Extension of the Two-Sided Normalized probability possibility transformation to the multivariate case

[a] Cendrella Chahine, Thierry Vidal, Mohamad El Falou and François Pérès
From Process Modelling to Planning Simulation Under Uncertainty in Crisis Rescue Management

Fuzzy Methods in Data Mining and Knowledge Discovery 2

Chairperson: Carlos Fernandez

Room: 01/F

J. Angel Diaz-Garcia, Carlos Fernandez-Basso, Karel Gutiérrez-Batista, M. Dolores Ruiz and Maria J. Martin-Bautista
Improving text clustering using a new technique for selecting trustworthy content in social networks

Mehran Amini, Miklos F. Hatwagner and Laszlo T. Koczy
Fuzzy system-based solutions for traffic control in freeway networks toward sustainable improvement

[a] Arnaud Castellort, Anne Laurent and Aboubacar Maman Sani
Fuzzy Similarity of Property Graphs

12:45 Lunch

14:15 **Parallel sessions**

Mathematical Fuzzy Logic

Chairperson: Tommaso Flaminio, Lluís Godo

Room: 01/A

Michal Holcapek and Antonin Dvorak
On semantic properties of monadic fuzzy quantifiers over fuzzy domains

Tommaso Flaminio, Lluís Godo, Paula Menchón and Ricardo Oscar Rodriguez
Rotations of Godel algebras with modal operators

Susana Cubillo, M^a del Carmen Torres-Blanc, Luis Magdalena and Pablo Hernández-Varela
Involutions on different Goguen L-fuzzy sets

Kavit Nanavati and Balasubramaniam Jayaram
On the Compatibility of Fuzzy Logic Connectives on the Generated Clifford Poset

Nhung Cao and Martin Stepnicka
Cutting of Partial Fuzzy Relations and Their Compositions

[a] Libor Behounek and Martina Dankova
The Bandler-Kohout Product of Fuzzy Relations with Undefined Membership Degrees

E-health

Chairperson:

Room: 01/B

Ofir Hanoach, Nalan Basturk, Rui Jorge Almeida and Tesfa Habtewold
Analysis of Graphical Causal Models with Discretized Data

Jasper Arendsen, Emil Rijcken, Kalliopi Zervanou, Kim Rietjens, Femke Vlems and Uzay Kaymak
Analyzing Patient Feedback Data with Topic Modeling

Danilo Ferreira de Carvalho, Uzay Kaymak, Pieter Van Gorp and Natal van Riel

Population and Individual Level Meal Response Patterns in Continuous Glucose Data

Arnau Mir, Carlos Lopez-Molina, Javier Fernandez, Felipe Antunes and Arnau Mir Torres
A framework for Active Contour initialization with application to liver segmentation in MRI

Tomasz Piłka, Bartłomiej Grzelak, Tomasz Górecki, Krzysztof Dyczkowski and Aleksandra Sadurska
Impact of changes in volumes of external training loads collected with wearable GPS sensors on the occurrence of injuries in football

Soft Computing and Artificial Intelligence Techniques in Image Processing 1

Chairperson: Irina Perfilieva and Javier Montero

Room: 01/F

Javier Fumanal Idocin, Zdenko Takac, Lubomira Horanska, Humberto Bustince and Óscar Cerdón
Fuzzy clustering to encode contextual information in artistic image classification

Pablo Flores-Vidal, Daniel Gómez, Javier Castro and Javier Montero
New aggregation strategies in Color Edge Detection with HSV images

Petr Hurtik, Vojtěch Molek and Hana Zámečnicková
Image segmentation losses with modules expressing a relationship between predictions

Jiří Janeček and Irina Perfilieva
Noise Reduction as an Inverse Problem in F-Transform Modelling

Irina Perfilieva and David Adamczyk
Selection of Key Points in 2D Images Using F-Transform

Jan Hůla, David Mojžíšek and David Adamczyk
3D Shapes Classification Using Intermediate Parts Representation

16:15 coffee break

16:45 **Parallel sessions**

Soft Computing and Artificial Intelligence Techniques in Image Processing 2

Chairperson: Irina Perfilieva and Carlos Lopez-Molina.

Room: 01/F

Felipe Antunes-Santos, Carlos Lopez-Molina, Arnau Mir-Fuentes, Maite Mendioroz and Bernard De Baets
Content-aware image smoothing based on fuzzy clustering

Salem Benferhat, Zied Bouraoui, Karim Tabia and Thanh Ma
Representing Vietnamese Traditional Dances and handling inconsistent information

Hana Zámečnicková and Irina Perfilieva
Laplace Operator in Connection to Underlying Space Structure

[a] Ali Hamache

Parzen-Rosenblatt Restoration of Markov Chains Corrupted by NonGaussian Noise

Data Science and Machine Learning 1

Chairperson: Luciano Sanchez

Room: 01/A

Andrzej Bedychaj, Przemysław Spurek, Aleksandra Nowak and Jacek Tabor
Nonlinear Weighted Independent Component Analysis

Hannah Blocher, Georg Schollmeyer and Christoph Jansen
Statistical Models for Partial Orders Based on Data Depth and Formal Concept Analysis

Marek Grzegorowski, Andrzej Janusz, Stanisław Łażewski, Maciej Świechowski and Monika Jankowska
Prescriptive Analytics for Optimization of FMCG Delivery Plans

[a] Daniel Kaluza, Andrzej Janusz and Dominik Ślęzak
Uncertainty Measures for Active Learning over Imbalanced Data

Olga Grigorenko and Valerijs Mihailovs
Aggregated fuzzy equivalence relations in clustering process

Theoretical and Applied Aspects of Imprecise Probabilities 1

Chairperson: Enrique Miranda

Room: 01/B

[a] Damjan Skulj
Normal cones corresponding to credal sets of probability intervals

Enrique Miranda, Ignacio Montes and Andrés Presa
Inner approximations of credal sets by non-additive measures

Giulianella Coletti, Sara Latini and Davide Petturiti
A discussion about independence and correlation in the framework of coherent lower conditional probability

Andrea Cinfrignini, Davide Petturiti and Barbara Vantaggi
Markov and time-homogeneity properties in Dempster-Shafer random walks

Friday, 15 July

09:00 **Keynote talk: Andrzej Skowron**
Chairperson: Janusz Kacprzyk
Room: Aula Magna

10:30 coffee break

11:00 **Parallel sessions**
Aggregation Theory beyond the Unit Interval 2
Chairperson: Raúl Perez Fernandez
Room: 01/F

Michał Burda, Martina Dankova and Viktor Pavliska
Sugeno Integral Extended to Undefined Inputs

Luca Anzilli and Marta Cardin

Sugeno integral based pandemic risk assessment

[a] Andrea Stupnanova

Time-dependent author-level metrics- abstract

Data Science and Machine Learning 2

Chairperson: Joao Paulo Carvalho

Room: 01/A

Fanny Pagnier, Frédéric Pourraz, Didier Coquin, Hervé Verjus and Gilles Mauris

A multilevel clustering method for risky areas in the context of avalanche danger management

Artur Simoes and Joao Paulo Carvalho

Fast Text-based Classification of News Snippets for Telecom Assurance

Mohith Rajesh, Chinmay Kulkarni and Shylaja S S

BEUD : Bifold-Encoder Uni-Decoder based Network for Anomaly Detection

[a] Andrzej Janusz, Andzelika Zalewska and Dominik Ślęzak

Introducing Approximation-based Model Diagnostics into KnowledgePit -- A Platform for Organizing Data Mining Challenges

Theoretical and Applied Aspects of Imprecise Probabilities 2

Chairperson: Enrique Miranda

Room: 01/B

Christoph Jansen and Thomas Augustin

Decision making with state-dependent preference systems

Tathagata Basu, Sebastien Destercke and Benjamin Quost

A robust Bayesian estimation approach for the imprecise Plackett–Luce model

Enrique Miralles-Dolz, Ander Gray, Edoardo Patelli and Scott Ferson

Correlated Boolean Operators for Uncertainty Logic

12:30 Closing session