

The 19th World Congress of the International Fuzzy
Systems Association

The 12th Conference of the European Society
for Fuzzy Logic and Technology

jointly with the AGOP, IJCRS, and FQAS conferences

IFSA – EUSFLAT 2021

Bratislava, Slovakia
September 19–24, 2021

Programme



The conference is organized by:

SIPKES, s.r.o.

Faculty of Civil Engineering (FCE),
Slovak University of Technology (STU)



SLOVAK UNIVERSITY OF
TECHNOLOGY IN BRATISLAVA
FACULTY OF CIVIL ENGINEERING

Institute for Research and Applications of Fuzzy Modeling,
University of Ostrava



UNIVERSITY OF OSTRAVA
INSTITUTE FOR RESEARCH
AND APPLICATIONS
OF FUZZY MODELING

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Messages from the General Chairs

Dear participants of IFSA/EUSFLAT 2021 congress in Bratislava,

it is our pleasure to welcome you in Slovakia. Note that the idea of EUSFLAT was born in Spain, and for the first time presented out of Spain just in Slovakia during the FSTA 1998 conference. Originally, IFSA/EUSFLAT 2021 congress was planned to be organized by Gent University in Belgium. This plan was disabled by the pandemic problems and related restrictions. To keep the connectedness of IFSA/EUSFLAT congresses, the Institute for Research and Applications of Fuzzy Modeling of the University of Ostrava (IRAFM) and the Slovak University of Technology in Bratislava (STU) have replaced the original organizers. With a great help of colleagues from all over the world, a valuable program was finally prepared, expressing the high interest in the topics of congress and its related subevents AGOP 2021, and associated IJCRS 2021 and FQAS 2021 conferences. Though due to the continued pandemic problems the congress should be realized in a hybrid form, partly on site in Bratislava and partly online, we believe that it will honestly follow the level of previous IFSA/EUSFLAT congresses in the richness and novelty of presented ideas, in numerous discussions of participants and in an attractive social program.



June 29, 2021

Radko Mesiar
IFSA-EUSFLAT General Chair



It is a genuine pleasure to welcome everybody to the 19th World Congress of the International Fuzzy Systems Association (IFSA) and the 12th Conference of the European Society for Fuzzy Logic and Technology (EUSFLAT) that take place jointly with the AGOP, IJCRS, and FQAS conferences in the big little city in the heart of Europe – Bratislava.

The Congress is organized every two years, and this one happens at the ending, we all hope, of the unprecedented period of our lives – the worldwide COVID-19 pandemic. Despite these unusual and challenging times, it is a true delight to see so much interest and level of participation in the IFSA-EUSFLAT 2021. Consequently, it is fully justified to start this welcome message with special gratitude to you – the authors – who have submitted the results of your work and put an extra effort to present them at the conference. Without you – this Congress would not take place. THANK YOU!

As usual, the Congress brings a plethora of new ideas, innovative methodologies, algorithmic developments, and challenging applications. In all of them, we see many exciting accomplishments and implementations. In addition, new ground-breaking thinking related to fuzzy modeling, control, pattern recognition, and applications of fuzzy technologies has become highly visible. All of these pursuits are well reflected in the versatile and comprehensive program of the Congress. I hope that every participant will find here something interesting and stimulating.

It is not possible to organize the Congress without the assistance, dedication, and support of many people. Special thanks go to the organizers of special sessions, the members of the Program

Committee, and the reviewers. All of you played a unique role in the process of making this Congress an extraordinary one.

I am particularly thankful to the members of the Organizing Committee; it is remarkable to see how their dedication, expertise, talents, and hard work helped overcome many unexpected and last moment obstacles and avoid potential last-minute glitches.

Thank you all for your contributions and your participation in the Congress. Welcome, and please enjoy your time in Bratislava.

July 30, 2021

Marek Reformat
President of IFSA

Dear participants, it is hard to follow the messages of my colleagues, friends, general co-chairs as all what had to be stated has been already stated. But thanksgiving never gets tired. Thank you all, thanks to my colleagues, thanks to the local team, thanks to all chairs and PC members, thanks to all special session organizers, thanks to Bernard de Baets, Chris Cornelis and Guy De Tré and the whole team from Ghent for their support, thanks to AGOP, IJCRS, and FQAS teams, thanks to Ladislav Šipeky, thanks to Radko Mesiar and Marek Reformat, and mainly thanks to you – participants.



I have never been even thinking about organizing an event in such conditions and I had no clue what the task is about. Even when we were making the decision to move the event to Bratislava due to restrictions in Belgium, probably none of us expected what is to come. And though sleepless night came, we never stopped hoping and believing. But this would never be enough. The main thing was that you – scientists, researchers, and students – never stopped hoping and believing. This was mirrored in 233 submissions (abstracts and full papers), most of them in the toughest situation in winter! The final numbers of accepted ones can still change as some participants may finally withdraw their submissions due to complicated situation, but I trust in a successful event.

It is the first time when EUSFLAT organizes its major event in a hybrid version. Many events were forced to go fully online, many conferences made this decision preventively to eliminate the potential risk. Such ideas were of course strongly tempting as the situation was very unclear and actually still it is. But we had an agreement among conference chairs that as long as there will be a non-zero chance to organize the event with on-site attendance, we will not give up. This led us to this point when we hopefully approach the biggest fuzzy conference since EUSFLAT 2019 with personal attendants. This decision was the most expensive one but we believe it paid off. The demands on the hybrid event are definitely higher than on a classical event and incomparable to purely online event. But we get a chance to meet and cooperate, not only to listen the voice from a speaker and to watch a 2D face on a screen, we get the smell of the previous world without borders, we get what we miss. And our less lucky friends and colleagues from heavily harmed regions who cannot come, may still and at least virtually connect to the real conference.

Let me kindly ask you to help us with this huge task. By enjoying the meeting, by fostering scientific cooperation, by giving your best to your talks, by being as you are.

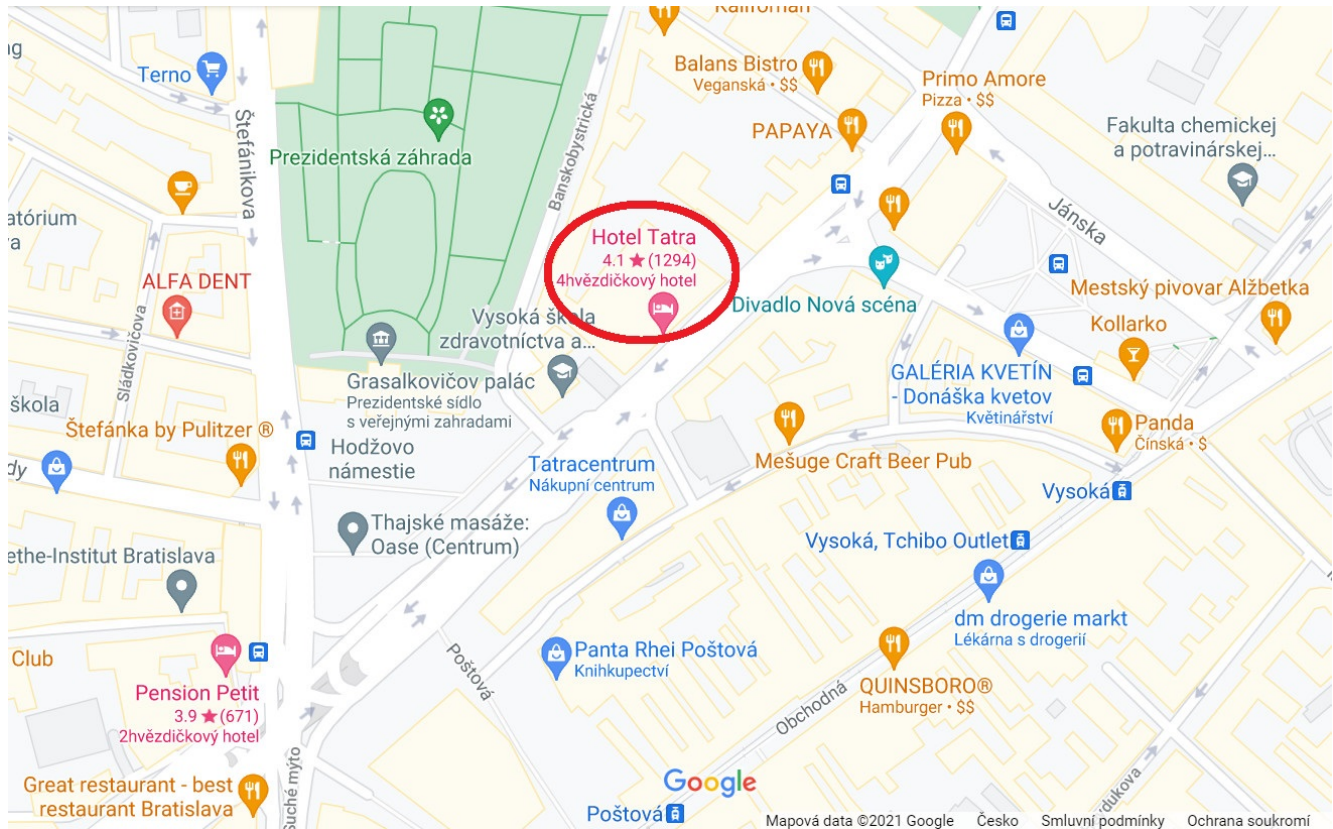
Factis ut credam facis. No need of words, trust deeds.

July 31, 2021

Martin Štěpnička
President of EUSFLAT

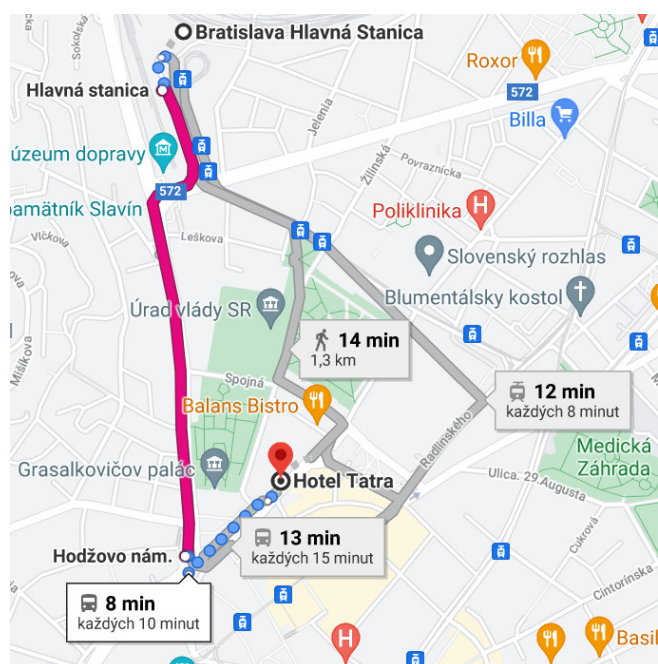
Conference Venue

The conference will take place in 4★ **Hotel Tatra**, Bratislava, Slovakia. The location of Hotel Tatra is shown on the map below. It is situated right in the downtown, neighbouring with Grassalkovich Palace (Presidential mansion), just crossing a street is enough to get to the business and historical centre of Bratislava. Bratislava Castle is within a walking distance from the hotel.



Getting to Hotel Tatra:

You can get to Hotel Tatra from Bratislava Hlavná stanica (Main station of the train) by walk but indeed, walking 1.3km with a suitcase is not pleasant. However, the shortest 15min ticket for 0.70EUR is enough (paper tickets as well as electronic ones can be used), take bus No. 93 and get off on the second stop "Hodzovo namestie" (Hodza square – right in front of Grassalkovich Palace) and then it is just 350m by walk. Another possibility is to take a taxi. We strongly recommend using either taxi cell-phone application (Bolt, Hopintaxi, ...) or some cell-phone app-based alternative taxi company (+421 2 16100, +421 2 16300, ...) rather than just jumping into the first taxi in front of the train station. (The price matters.)



If you come to Bratislava Airport, you can use bus No. 210 to get to Bratislava Hlavna stanica (train main station). But we recommend using direct transport to the hotel. Again, we recommend to order it in advance for a given price and then 20EUR could be enough.

Landing to Vienna airport will be probably very comfortable way how to get as close to Bratislava as possible from long distances without changing the flights too often. Getting from Vienna airport to Bratislava is not difficult as there is a direct shuttle to Bratislava city centre. But again, for your comfort after a long journey, we recommend to book a taxi/airport transfer in advance and for a price around 60EUR, you can get smoothly to Hotel Tatra.

Registration

Registration desk will be located directly in the Hotel Tatra, the conference venue. Dates and opening hours of the registration desk are the following:

September 19, 2021 (Sunday, the arriving day) **16:00–21:00**
September 20, 2021 (Monday, Conference opening day) **07:30–10:00**
September 21–23, 2021 **08:00–09:00**

Internet Access

Internet access is offered to all registered attendees in Hotel Tatra for free and without password.

Coffee Breaks

Breaks with coffee and refreshments will be provided to all registered attendees.

General Information

About Bratislava

Bratislava is the capital and largest city in Slovakia. The population of the city is officially about 430,000, however, it is estimated to be more than 660,000. It is situated in southwestern Slovakia at the foot of the Little Carpathians, occupying both banks of the River Danube and the left bank of the River Morava. Bordering Austria and Hungary, it is the only national capital that borders two sovereign states. Bratislava is often windy with a marked variation between hot summers and cold, humid winters. The city is in one of the warmest and driest parts of Slovakia.

One of the city dominants which can be seen from far distance is The Castle of Bratislava. The most attractive part of Bratislava is the Old Town where the most historical sights as well as cultural institutions are concentrated. Its tiny lanes offer an ideal atmosphere for romantic walks to those who love to follow signs of history in the middle of modern world.

Bratislava is one of the youngest Capitals of the world. The modern metropolis is opened to Europe and to the world as proved by the increasing number of foreign visitors of most diverse countries. They are attracted by the cosiness of the rather small city that nevertheless possesses a throbbing social life and historic charms combined with the most recent trends. Palaces, modern shopping and trade centres, admirable arts of the Slovak cooks and brewers, friendly people and various international cultural or sport events, exhibitions are the reasons why it is worth of visit.

Health

The emergency phone number to police, ambulance and the fire department is 112.

Currency

The official currency of Slovakia is the EURO – the official currency of the European Union. Euro coins come in eight denominations of one cent, two cents, five cents, ten cents, 20 cents, 50 cents, €1, and €2. Banknotes come in denominations of €5, €10, €20, €50, €100, €200, and €500.

You can exchange the currency in many authorized exchange offices. However, the vast majority of hotels, shops, and restaurants accept credit/debit cards and even small payments by cards are very usual. Paying by card is usually cheaper than accepting the exchange rates offered by hotels. Money can be also withdrawn from ATM's that are located in the whole city.

Language

The official language of Slovakia is Slovak. However, many Slovak people speak at least one foreign language, mostly English. The conference and all its activities will be conducted in English.

Electricity

In Slovakia the power plugs and sockets are of type E. The standard voltage is 230 V and the standard frequency is 50 Hz.

Telephone

The international access code for Slovakia is +421. Please silence your mobile phone during all conference sessions.

Weather

Bratislava is in a region with a continental climate. September is still a pleasant month with average high temperatures equal to 21°C and average low temperatures equal to 12°C.

Timezone

Slovakia uses the Central European Time (CET) that is the Greenwich Mean Time (GTM) plus 1 hour. From April to October, the summertime is used, i.e. GTM +2 hours.

Sources:

<https://slovakia.travel/en/bratislava>,

<https://en.wikipedia.org/wiki/Bratislava>,

<https://www.weather-atlas.com/en/slovakia/bratislava-climate>

Social Events

Welcome Cocktail

Date: Sunday, 19 September, 2021

Time: 17:00–21:00

Venue: Hotel Tatra

Came and take a drink with organizers and other participants! You will also have a chance to register and pick up your materials to avoid potential queues next morning.

Bratislava “Old town” guided tour

Date: Tuesday, 21 September, 2021

Time: 16:00–17:30

Meeting point: Hotel Tatra at 15:50

As the conference venue is on the border of the historical center of Bratislava, also called “Old town” it is the best time to know the surrounding as soon as possible to be able to explore the details of Bratislava later your own. You will meet the city guides directly in front of the hotel reception and they will collect you to groups up to 30 persons and take you through the “Old town” of the Bratislava. The tour will take about 90 min and will end directly in the Hotel Tatra.

Social event in Theatre

Date: Wednesday, 22 September, 2021

Time: 18:00–19:30

Venue: Hotel Tatra

Directly inside of the hotel is a Theater called “Štúdio L + S” named after two Slovak comedians M. Lasica and J. Satinský. In this Theatre we are preparing a program that can be followed also online. Program will include a small talk show, music performance of famous operetta arias, Awards ceremonies and more.

Social dinner

Date: Thursday, 23 September, 2021

Time: 18:30–23:00

Venue: Moyzes Hall

Social dinner will be in richly decorated Art Nouveau Moyzes Hall is located in the main building of the Faculty of Arts, Comenius University near the Danube River. The address of the building is Gondova Street, but Moyzes Hall is actually accessed from around the corner from Vajanského Street. Moyzes Hall is named after the Slovak composer Alexander Moyzes (1906–1984). Designed

by Vienna architect Josef Rittner in the early 20th century, the representative hall is nowadays used for classical music concerts, various academic purposes and other public events.

For transportation to the Social dinner venue and from the Social dinner venue from the hotel will be provided by busses.

From Hotel Tatra to Social dinner venue: **18:00**

From Moyzes Hall to Hotel Tatra: **22:40, 23:00**



Program at a Glance

Sunday 19 September 2021

17:00 – 21:00 Welcome cocktail Hotel

Monday 20 September 2021

9:00 – 9:30 Opening Lux

9:30 – 10:30 Plenary Talk 1: Do We Need Fuzzy Cluster Analysis? Lux
Frank Klawonn

10:30 – 11:00 Coffee break Foyer

11:00 – 12:20 Parallel Sessions 1-5

12:30 – 14:00 Lunch Hotel restaurant

14:00 – 15:20 Parallel Sessions 6-10

15:20 – 15:50 Coffee break Foyer

15:50 – 17:30 Parallel Sessions 11-15

Tuesday 21 September 2021

9:10 – 10:30 Parallel Sessions 16-20

10:30 – 11:00 Coffee break Foyer

11:00 – 12:20 Parallel Sessions 21-24

12:30 – 14:00 Lunch Hotel restaurant

14:00 – 15:00 Plenary Talk 2: Preference Learning in Evolutionary Multiobjective Optimization Lux
Roman Słowiński

15:00 – 16:00 IFSA Council meeting Grand

16:00 – 17:30 Guided city tour

Wednesday 22 September 2021

9:10 – 10:30 Parallel Sessions 25-28

10:30 – 11:00 Coffee break Foyer

11:00 – 12:20 Parallel Sessions 29-32

12:30 – 14:00 Lunch Hotel restaurant

14:00 – 15:00 Plenary Talk 3: Protecting Data Privacy in Emerging Scenarios Lux
Sabrina De Capitani di Vimercati

15:00 – 16:00 EUSFLAT Assembly Lux

16:00 – 17:00 IFSA General meeting Lux

18:00 – 19:30 Social event in Theatre Theatre

Thursday 23 September 2021

9:10 – 10:30 Parallel Sessions 33-36

10:30 – 11:00 Coffee break Foyer

11:00 – 12:20 Parallel Sessions 37-41

12:30 – 14:00 Lunch Hotel restaurant

14:00 – 15:00	Plenary Talk 4:	Handling Uncertainty in Dynamical Systems: Challenges and Opportunities	Lux
		<i>Martine Ceberio</i>	
15:00 – 15:30	Coffee break		Foyer
15:30 – 16:50	Parallel Sessions 42-46		
18:30 – 23:00	Gala Dinner		Moyzes hall

Friday

24 September 2021

9:30 – 10:50	Parallel Sessions 47-50		
10:50 – 11:20	Coffee break		Foyer
11:20 – 12:20	Plenary Talk 5:	Fuzzy Implication Functions 2.0: From Theoretical Results to Applications and Vice Versa	Lux
		<i>Sebastia Massanet</i>	
12:20 – 12:40	Closing ceremony		Lux
13:00 – 14:00	Lunch		Hotel restaurant
18:00 – 22:00	Farewell party		1st Slovak Pub

Programme in Details

Sunday **19 September 2021**

17:00 – 21:00 Welcome cocktail **Hotel**

Monday **20 September 2021**

9:00 – 9:30 Opening **Lux**

Plenary Talk 1 **Chair:** Martin Štěpnička **Lux**

9:30 – 10:30 Do We Need Fuzzy Cluster Analysis?
Frank Klawonn

10:30 - 11:00 Coffee break **Foyer**

Session 1 (IFSA-EUSFLAT) **Chair:** Irina Perfilieva **Lux**

SS 16 - Mathematical Methods Towards Dealing with Uncertainty in Data Sciences

11:00 – 11:20 Fuzzy Partitions and Multi-Scale Representation of 1D Data
Irina Perfilieva and David Adamczyk

11:20 – 11:40 F1-transform in fuzzy Fredholm integral equations
Irina Perfilieva and Tam Pham

11:40 – 12:00 On quotient structures of fuzzy multiset finite automata
Anand Pratap Singh, Mahesh Kumar Dubey and Irina Perfilieva

12:00 – 12:20 Laplacian Singular Values
Jiří Janeček and Irina Perfilieva

Session 2 (IFSA-EUSFLAT) **Chair:** Graçaliz Dimuro **Standard A**

SS 19 - Deep Learning Under Uncertain and Imperfect Information

11:00 – 11:20 Optimizing Feature Importance in the Decision Making Phase for Motor Imagery Brain Computer Interfaces using Automatic Differentiation
Javier Fumanal Idocin, Martin Papco, Francisco Javier Fernández, Graçaliz Dimuro Pereira, Carmen Vidaurre, Marisol Gómez and Humberto Bustince

11:20 – 11:40 Fusion of local features by means of linear combinations of increasing functions on Convolution Neural Networks
Iosu Rodríguez-Martínez, Julio Lafuente, Regivan H. N. Santiago, Mikel Sesma, Francisco Herrera, Pablo Ursúa and Humberto Bustince

11:40 – 12:00 Sequential information fusion based in multidimensional Choquet-like discrete integral
Mikel Ferrero-Jaurrieta, Zdenko Takáč, Ľubomíra Horanská, Iosu Rodríguez-Martínez, Graçaliz Pereira Dimuro and Humberto Bustince

12:00 – 12:20 Modification of the ADALINE using Choquet integrals and their generalizations
Asier Urio, Humberto Bustince, Laura De Miguel, Javier Fernandez, Graçaliz Dimuro and Zdenko Takáč

Session 3 (IFSA-EUSFLAT) **Chair:** Frank Klawonn **Classic**

Best student papers

11:00 – 11:20 Fuzzy optimization multi-objective clustering ensemble model for multi-source data analysis
Le Cam Binh, Pham Van Nha and Ngo Thanh Long

- 11:20 – 11:40** Evolving Fuzzy Neural Network based on Uni-nullneuron to identify Auction Fraud
Paulo Vitor de Campos Souza, Edwin Lughofer and Augusto Junio Guimaraes
- 11:40 – 12:00** Convexity of Interval-valued Fuzzy Sets Applied to Decision Making Problems
Pedro Huidobro, Pedro Alonso, Vladimír Janiš and Susana Montes

Session 4 (IJCRS) Chair: Stefania Boffa Grand

- 11:00 – 11:20** Possibility Distributions Generated by Intuitionistic L-Fuzzy Sets
Stefania Boffa and Davide Ciucci
- 11:20 – 11:40** Adapting fuzzy rough sets for classification with missing values
Oliver Urs Lenz, Daniel Peralta and Chris Cornelis
- 11:40 – 12:00** Possible Coverings in Incomplete Information Tables with Similarity of Values
Michinori Nakata, Norio Saito, Hiroshi Sakai and Takeshi Fujiwara
- 12:00 – 12:20** Fuzzy-Rough Nearest Neighbour Approaches for Emotion Detection in Tweets
Olha Kaminska, Chris Cornelis and Veronique Hoste

Session 5 (AGOP) Chair: Javier Montero Standard B

- 11:00 – 11:20** Aggregation based on outliers
Anna Kolesárová and Radko Mesiar
- 11:20 – 11:40** Continuous OWA operators
Martin Kalina
- 11:40 – 12:00** On some generalizations of homogeneity of aggregation functions
Andrea Stupňanová and Yong Su
- 12:00 – 12:20** New Classes of the Moderate Deviation Functions
Jana Špírková, Humberto Bustince, Javier Fernandez and Mikel Sesma-Sara

12:30 - 14:00 Lunch Hotel restaurant

Session 6 (IFSA-EUSFLAT) Chair: Michal Holčapek Lux

Dynamical Modeling

SS 16 - Mathematical Methods Towards Dealing with Uncertainty in Data Sciences

- 14:00 – 14:20** Solution to the Advection Equation with Fuzzy Initial Condition via Sup-J Extension Principle
Vinícius Wasques, Estevão Esmi and Laécio C. Barros
- 14:20 – 14:40** Bidimensional fuzzy initial value problem of autocorrelated fuzzy processes via cross product: the prey-predator model
Beatriz Laiate, Laécio Barros, Francielle Santo Pedro and Estevão Esmi
- 14:40 – 15:00** Discrete Laplace Operator in the Space with a Fuzzy Partition
(SS 16) *Hana Zámečnicková and Irina Perfilieva*
- 15:00 – 15:20** Reconstruction of residuated lattice-valued functions by integral transforms
Michal Holčapek and Viec Bui Quoc

Session 7 (IFSA-EUSFLAT) Chair: Jiří Močkoř Standard A

Basics of fuzzy set theory

- 14:00 – 14:20** Extending representability on the set of intervals endowed with admissible orders for the construction of interval-valued fuzzy operators
Lidiane Silva, Guilherme Schneider, Bruna Freitas, Adenauer Yamin, Helida Santos, Benjamin Bedregal and Renata Reiser

- 14:20 – 14:40** Interpretable monotonicities for entropies of intuitionistic fuzzy sets or interval-valued fuzzy sets
Christophe Marsala and Bernadette Bouchon-Meunier
- 14:40 – 15:00** Description of maximal Archimedean t-norms on finite chains
Carlos Bejines López and Mirko Navara
- 15:00 – 15:20** On t-Conorm Based Fuzzy (Pseudo)metrics and Applications in Combinatorics on Words
Raivis Bēts

Session 8 (FQAS) Chair: Guy De Tré Classic

Model-based approaches for flexible querying

- 14:00 – 14:20** Analogical querying?
Henri Prade and Gilles Richard
- 14:20 – 14:40** Flexible Querying using Disjunctive Concepts
Gregory Smits, Marie-Jeanne Lesot, Olivier Pivert and Ronald Yager
- 14:40 – 15:00** Analytical Queries on Vanilla RDF Graphs with a Guided Query Builder Approach
Sebastien Ferre
- 15:00 – 15:20** On Controlling Skyline Query Results: What does Soft Computing bring?
Allel Hadjali

Session 9 (IJCRS) Chair: Chris Cornelis Grand

Keynote 1

- 14:00 – 15:20** Rough sets, fuzzy sets, ill-known sets and related topics: a discussion
Didier Dubois

Session 10 (AGOP) Chair: Radko Mesiar Standard B

- 14:00 – 14:20** Some remarks on convolution of collection integrals
Adam Šeliga
- 14:20 – 14:40** Expectation quadruplet based on fuzzy integrals
Zuzana Ontkovičová and Jozef Kiselák
- 14:40 – 15:00** Generalization of interval-valued Sugeno integral
Lubomíra Horanská, Zdenko Takáč and Humberto Bustince
- 15:00 – 15:20** General Admissibly Ordered Interval-valued Overlap Functions
Tiago Asmus, Graçaliz Dimuro, José Antonio Sanz, Jonata Wieczynski, Giancarlo Lucca, Eduardo Borges and Humberto Bustince

15:20 - 15:50 Coffee break Foyer

Session 11 (IFSA-EUSFLAT) Chair: Jiří Kupka Lux

Dynamical modeling

- 15:50 – 16:10** A Numerical Approach For Determining Interactivity: A Case Study in Chemical Degradation
Peter Sussner, Vinícius Wasques, Julio César Fernandes and Estevão Esmi
- 16:10 – 16:30** Graded fuzzy preconcept lattices: Theoretical basis
Alexaner Šostak, Ingrida Ujlane and Māris Krastiņš
- 16:30 – 16:50** Simulations of fuzzy dynamical systems
Nicole Škorupová
- 16:50 – 17:10** On notions of fuzzy topological entropy
Jiří Kupka and Jose Cánovas

Session 12 (IFSA-EUSFLAT) **Chair:** Martina Daňková **Standard A**

Basics of fuzzy set theory

- 15:50 – 16:10** Monadic power set theories in Kleisli categories
Jiří Močkoř
- 16:10 – 16:30** Closure systems as a fuzzy extension of meet-subsemilattices
Manuel Ojeda-Hernandez, Inma P. Cabrera, Pablo Cordero and Emilio Muñoz-Velasco
- 16:30 – 16:50** How some methods in fuzzy sets, fuzzy soft sets, hesitant fuzzy sets and intuitionistic fuzzy sets can be unified?
Jiří Močkoř
- 16:50 – 17:10** Fuzzy partitioned discrete-event systems under controllability
Shailendra Singh and S Tiwari

Session 13 (FQAS) **Chair:** Sławomir Zadrozny, Gloria Bordogna **Classic**

Model-based approaches for trustfulness/veracity and uncertainty/fuzziness of both data and queries

- 15:50 – 16:10** Dealing with Data Veracity in Multiple Criteria Handling: An LSP-based approach
Guy De Tre and Jozo Dujmovic
- 16:10 – 16:30** Realization of a Natural Logic in a Database System
Troels Andreasen, Henrik Bulskov and Jørgen Fischer Nilsson
- 16:30 – 16:50** Management of Complex and Fuzzy Queries Using a Fuzzy SOLAP-Based Framework
Sinan Keskin and Adnan Yazici
- 16:50 – 17:10** Generalized Weighted Repairs
Horacio Tellez Perez and Jef Wijsen

Session 14 (IJCRS) **Chair:** Sheela Ramanna **Grand**

Keynote 2

- 15:50 – 17:10** Classification of multi-class imbalanced data: data difficulty factors and selected methods for improving classifiers
Jerzy Stefanowski

Session 15 (AGOP) **Chair:** Michał Baczyński **Standard B**

SS 3 - Fuzzy Implication Functions

- 15:50 – 16:10** On some functional equations related to alpha migrative t-conorms
Katarzyna Miś and Michał Baczyński
- 16:10 – 16:30** A generalization of power-based implications
Michał Baczyński, Włodzimierz Fechner and Sebastia Massanet
- 16:30 – 16:50** An analysis of the invariance property with respect to powers of nilpotent t-norms on fuzzy implication functions
Raquel Fernandez-Peralta, Sebastia Massanet and Arnau Mir
- 16:50 – 17:10** On the preservation of some additional properties via the quadratic polynomial construction method of fuzzy implication functions
Isabel Aguiló, Sebastia Massanet and Juan Vicente Riera
- 17:10 – 17:30** New results on discrete implication functions
Sebastià Massanet, Marc Munar and Daniel Ruiz-Aguilera

Session 16 (IFSA-EUSFLAT)

Chair: Zdenko Takáč

Lux

- 9:10 – 9:30** Audio surveillance of road traffic: An approach based on anomaly detection and interval type-2 fuzzy sets
Stefano Rovetta, Zied Mnasri, Francesco Masulli and Alberto Cabri
- 9:30 – 9:50** Fuzzy object interpretation for improved performance in active contour models
Arnau Mir, Francisco Javier Fernandez, Laura De Miguel and Carlos Lopez-Molina
- 9:50 – 10:10** Estimating Polychoric Correlations from Fuzzy Frequency Tables
Antonio Calcagni
- 10:10 – 10:30** Restricted Equivalence Functions on L^n : A new equivalence measure between n-multisets applied on color pixels for image comparison
Aitor Castillo-López, Zdenko Takáč, Carlos Lopez-Molina, Javier Fernandez and Humberto Bustince

Session 17 (IFSA-EUSFLAT)

Chair: Vilém Novák

Standard A

SS 10 - Modelling Vagueness in Natural Language

- 9:10 – 9:30** Using automatic facial emotion recognition for content analyses of a language learner video corpus
Xinyi Chen, Yu-Yin Hsu and Emmanuele Chersoni
- 9:30 – 9:50** Fuzzy Property Grammar and Fuzzy Natural Logic for describing linguistic vagueness
Adrià Torrens
- 9:50 – 10:10** How NLP Can Benefit From a Fuzzy Classification of Language Universals
Antoni Brosa Rodríguez
- 10:10 – 10:30** Towards a Fuzzy Model for Approaching Verbal Violence
Susana M. Campillo-Muñoz and M. Dolores Jimenez-Lopez

Session 18 (FQAS)

Chair: Gloria Bordogna

Classic

Data - Driven approaches

- 9:10 – 9:30** Detecting ESG Topics Using Domain-Specific Language Models and Data Augmentation
Tim Nugent, Nicole Stelea and Jochen L. Leidner
- 9:30 – 9:50** A Novel Approach for Supporting Italian Satire Detection through Deep Learning
Gabriella Casalino, Alfredo Cuzzocrea, Giosùe Lo Bosco, Mariano Maiorana, Giovanni Pilato and Daniele Schicchi
- 9:50 – 10:10** DocTalk: Combining Dependency-based Text Graphs and Deep Learning into a Practical Dialog Engine
Yifan Guo, Weilun Sun, Ali Khan, Tam Doan and Paul Tarau
- 10:10 – 10:30** A comparative study of word embeddings for the construction of a social media expert filter
J. Angel Diaz-Garcia, M. Dolores Ruiz and Maria J. Martin-Bautista

Session 19 (IJCRS)

Chair: María Eugenia Cornejo

Grand

- 9:10 – 9:30** Many-Valued Dynamic Object-Oriented Inheritance and Approximations
Andrzej Szalas
- 9:30 – 9:50** Feature Reduction and Disambiguation in Learning from Fuzzy Labels using Rough Sets
Andrea Campagner and Davide Ciucci
- 9:50 – 10:10** Knowledge Graph Representation Learning for Link Prediction with Three-Way Decisions
Zhihan Peng and Hong Yu
- 10:10 – 10:30** The Influence of Fuzzy Expectations on Triples of Triangular Norms in the Weighted Fuzzy Petri Net for the Subject Area of Passenger Transport Logistics
Yurii Blosko, Zbigniew Suraj and Oksana Olar

Session 20 (AGOP)		Chair: Javier Fernandez	Standard B
9:10 – 9:30	Fuzzy Relations and Monometrics: Some Correspondences <i>Megha Gupta and Balasubramaniam Jayaram</i>		
9:30 – 9:50	An overview of honeycomb-based graph aggregation functions. <i>Grzegorz Moś</i>		
9:50 – 10:10	Extreme points of polytopes of discrete copulas <i>Elisa Perrone and Fabrizio Durante</i>		
10:10 – 10:30	On a construction method of trivariate copulas <i>Claudio Ignazzi and Fabrizio Durante</i>		
10:30 - 11:00 Coffee break			Foyer
Session 21 (IFSA-EUSFLAT)		Chair: Petra Murinová	Lux
<i>Fuzzy systems</i>			
11:00 – 11:20	Probabilistic and Standard Fuzzy Systems in Fuzzy Natural Logic: A Comparison in Time Series Modeling <i>Linh Nguyen</i>		
11:20 – 11:40	Interpolativity and Continuity of Similarity-Based Reasoning Fuzzy Inference <i>Sayantana Mandal and Balasubramaniam Jayaram</i>		
11:40 – 12:00	Similarity-based reasoning from the perspective of extensionality <i>Antonín Dvořák, Balasubramaniam Jayaram and Martin Štěpnička</i>		
12:00 – 12:20	Linear Regression Approach to Fuzzy Cognitive Maps with History Data <i>Vesa Niskanen</i>		
Session 22 (FQAS)		Chair: Troels Andreasen, Janusz Kacprzyk	Classic
<i>FQAS in practice and Open Discussion</i>			
11:00 – 11:20	Aggregation for flexible Challenge Response <i>Samuel Brezani and Peter Vojtáš</i>		
11:20 – 11:40	J-CO, a Framework for Fuzzy Querying Collections of JSON Documents (Demo) <i>Paolo Fosci and Giuseppe Psaila</i>		
11:40 – 12:00	The Impact of User Demographics and Task Types on Cross-App Mobile Search <i>Mohammad Aliannejadi, Fabio Crestani, Theo Huibers, Monica Landoni, Emiliana Murgia and Maria Soledad Pera</i>		
12:00 – 12:20	Discussion and closing		
Session 23 (IJCRS)		Chair: Jesus Medina	Grand
11:00 – 11:20	Right adjoint algebras versus operator left residuated posets <i>M. Eugenia Cornejo and Jesús Medina</i>		
11:20 – 11:40	Revisiting impact of local congruences in variable selection from datasets <i>Roberto G. Aragón, Jesús Medina and Eloisa Ramírez Poussa</i>		
11:40 – 12:00	Bipolar max-product fuzzy relation equations with the standard negation <i>M. Eugenia Cornejo, David Lobo and Jesús Medina</i>		
12:00 – 12:20	Relation-based fuzzy granular approximations <i>Marko Palangetić, Chris Cornelis, Salvatore Greco and Roman Słowiński</i>		

Session 24 (AGOP) **Chair:** Graçaliz Dimuro **Standard B**

SS 18 - Applications of Pre-Aggregation Functions and Generalized Forms of Aggregation

- 11:00 – 11:20** The Borda Count as an initial threshold for Kemeny ranking aggregation
Noelia Rico, Camino Rodríguez-Vela, Raúl Pérez-Fernández and Irene Díaz
- 11:20 – 11:40** Combining classifiers with the interval-valued Choquet integral
Zdenko Takáč, Mikel Uriz, Mikel Galar, Daniel Paternain and Humberto Bustince
- 11:40 – 12:00** Aggregation and pre-aggregation functions in optimization problems of ensemble classifiers
Urszula Bentkowska, Wojciech Gałka and Marcin Mrukowicz
- 12:00 – 12:20** Affinity Functions and Centrality Measures in Social Network Analysis
Javier Fumanal Idocin, María Minárová, Francisco Javier Fernández, Oscar Cordón and Humberto Bustince

12:30 - 14:00 Lunch **Hotel restaurant**

Plenary Talk 2 **Chair:** Vilém Novák **Lux**

- 14:00 – 15:00** Preference Learning in Evolutionary Multiobjective Optimization
Roman Słowiński

15:00 - 16:00 IFSA Council meeting **Grand**

16:00 – 17:30 Guided city tour

Wednesday **22 September 2021**

Session 25 (IFSA-EUSFLAT) **Chair:** Juan A. Mendéz **Lux**

SS 12 - Fuzzy Modelling and Control of Dynamic Systems

- 9:10 – 9:30** Detection of anomalies in sensor data using neurofuzzy systems
Fabio Rodríguez, William D. Chicaiza, Adolfo J. Sánchez and Juan M. Escano
- 9:30 – 9:50** Nonlinear Fuzzy Model Predictive Control of the TCP-100 Parabolic Trough Plant
Juan Manuel Escano, Antonio J. Gallego, Adolfo J. Sanchez, Luis J. Yebra and Eduardo F. Camacho
- 9:50 – 10:10** Neuro-fuzzy modelling of a linear Fresnel-type solar collector system as a digital twin
William D. Chicaiza, Adolfo J. Sanchez, Antonio J. Gallego and Juan M. Escano
- 10:10 – 10:30** A Fuzzy-based approach for energy management of DHW systems in hotels
Marlon Llano, Ricardo Mesa-Cruz, Alberto Hamilton, Juan Francisco Acosta and Juan Albino Mendez Perez

Session 26 (IFSA-EUSFLAT) **Chair:** Michal Burda **Standard A**

Data analysis

- 9:10 – 9:30** Fuzzy Clustering-based Switching Non-negative Matrix Factorization and Its Application to Environmental Data Analysis
Katsuhiko Honda, Tomoaki Furukawa, Seiki Ubukata and Akira Notsu
- 9:30 – 9:50** Discovery of pairwise ordinal edit rules
Milan Peelman, Antoon Bronselaer and Guy De Tré
- 9:50 – 10:10** Fuzzy co-clustering algorithm for multi-source data mining
Le Cam Binh, Pham Van Nha and Pham The Long
- 10:10 – 10:30** Analysis of the relation among global stocks using Fuzzy/LinguisticIF-THEN rules
Soheyla Mirshahi, Sina Mirshahi and Vilém Novák

Session 27 (IJCRS)		Chair: Oliver Lenz	Grand
9:10 – 9:30	The RSDS - a Tool for Users of Rough Sets and Related Domains <i>Zbigniew Suraj and Piotr Grochowalski</i>		
9:30 – 9:50	PNeS in Modelling, Control and Analysis of Concurrent Systems <i>Zbigniew Suraj and Piotr Grochowalski</i>		
9:50 – 10:10	3RD: A multi-criteria decision-making method based on three-way rankings <i>Yiyu Yao and Chengjun Shi</i>		
10:10 – 10:30	Minimizing Depth of Decision Trees with Hypotheses <i>Mohammad Azad, Igor Chikalov, Shahid Hussain and Mikhail Moshkov</i>		
Session 28 (AGOP)		Chair: Sebastia Massanet	Standard B
9:10 – 9:30	Applicability of ordinal sums of conjunctive and disjunctive functions in classification <i>Miroslav Hudec, Radko Mesiar and Erika Mináriková</i>		
9:30 – 9:50	Construction of commutative, associative functions via z-ordinal sum construction <i>Andrea Mesiarová-Zemánková</i>		
9:50 – 10:10	On DU-ordinal sums of partially ordered monoids <i>Michal Holčapek, Antonín Dvořák and Jan Paseka</i>		
10:10 – 10:30	Inf- and sup-preserving aggregation functions <i>Marta Cardin</i>		
10:30 - 11:00	Coffee break		Foyer
Session 29 (IFSA-EUSFLAT)		Chair: Javier Montero	Lux
<i>SS 12 - Fuzzy Modelling and Control of Dynamic Systems</i>			
<i>SS 15 - Modeling Decisions in AI</i>			
11:00 – 11:20	DC Microgrid Control Containing Virtual Supercapacitor (SS 12) <i>Navid Piri Yengjeh, Hassan Moradi Cheshmehbeigi and Kumars Rouzbehi</i>		
11:20 – 11:40	A soundness test for multi criteria decision models with imprecise data (SS 15) <i>Camilo Franco De Los Ríos and Jens Leth Hougaard</i>		
11:40 – 12:00	Semantics for reciprocal preferences (SS 15) <i>Fabian Alberto Castiblanco Ruiz, Camilo Franco De Los Ríos, J. Tinguaro Rodríguez and Javier Montero</i>		
12:00 – 12:20	An Ordered Weighted Averaging Operator based on Extreme Values Reductions. (SS 15) <i>Diego García-Zamora, Álvaro Labella, Rosa M. Rodríguez and Luis Martínez</i>		
Session 30 (IFSA-EUSFLAT)		Chair: Gabriella Casalino	Standard A
<i>SS 4 - Soft Computing for Evolving Data Streams: Advances in Real-Time Pattern Recognition</i>			
11:00 – 11:20	Evolving Fuzzy System Applied to Battery Charge Capacity Prediction for Fault Prognostics (SS 4) <i>Murilo Osorio Camargos, Iury Bessa, Luiz Cordovil Junior, Pedro Henrique Silva Coutinho, Daniel Leite and Reinaldo Martínez Palhares</i>		
11:20 – 11:40	Incremental Learning and State-Space Evolving Fuzzy Control of Nonlinear Time-Varying Systems with Unknown Model (SS 4) <i>Daniel Leite, Pedro Coutinho, Iury Bessa, Murilo Camargos, Luiz Cordovil Junior and Reinaldo Palhares</i>		
11:40 – 12:00	Balancing data within incremental semi-supervised fuzzy clustering for credit card fraud detection (SS 4) <i>Gabriella Casalino, Giovanna Castellano and Nicola Marvulli</i>		
12:00 – 12:20	Fuzzifying Geospatial Data to Identify Critical Traffic Areas <i>Jhonny Pincay, Edy Portmann and Luis Terán</i>		

Session 31 (IJCRS) Chair: Davide Ciucci Grand

Keynote 3

11:00 – 12:20 Rough-Fuzzy Segmentation of Brain MR Volumes: Applications in Tumor Detection and Malignancy Assessment
Pradipta Maji and Shaswati Roy

Session 32 (AGOP) Chair: Humberto Bustince Standard B

SS 17 - Theoretical Aspects of Pre-Aggregation Functions and Generalized Forms of Monotonicity and Aggregation

11:00 – 11:20 Empirical monotonicity of Non-deterministic Computable Aggregations
Luis Garmendía, Daniel Gómez, Luis Magdalena and Javier Montero

11:20 – 11:40 d-XC-integrals: On the generalization of the expanded form of the Choquet integral by restricted dissimilarity functions
Jonata Wieczynski, Giancarlo Lucca, Eduardo Borges, Tiago C. Asmus, Leonardo Emmendorfer, Humberto Bustince and Graçaliz Dimuro

11:40 – 12:00 On a special class of interval-valued fuzzy operators
Paweł Drygaś

12:30 - 14:00 Lunch Hotel restaurant

Plenary Talk 3 Chair: Guy De Tré Lux

14:00 – 15:00 Protecting Data Privacy in Emerging Scenarios
Sabrina De Capitani di Vimercati

15:00 – 16:00 EUSFLAT Assembly Lux

16:00 – 17:00 IFSA General meeting Lux

18:00 – 19:30 Social event in Theatre Theatre

Thursday 23 September 2021

Session 33 (IFSA-EUSFLAT) Chair: Przemysław Grzegorzewski Lux

SS 8 - Fuzzy Methods in Statistics and Data Analysis

9:10 – 9:30 Monitoring acoustic data streams using possibilistic aggregation and multi label learning
Katarzyna Kaczmarek-Majer, Olgierd Hryniewicz, Dominika Kornobis and Anna Stachowiak

9:30 – 9:50 The use of similarity measures in the method of selecting features for classification under uncertainty
Barbara Pękala, Krzysztof Dyczkowski, Jarosław Szkoła and Dawid Kosior

9:50 – 10:10 Possibilistic granular count: derivation and extension to granular sum
Corrado Mencar

10:10 – 10:30 On a graded version of stochastic dominance
Raúl Pérez-Fernández, Juan Baz, Irene Díaz and Susana Montes

Session 34 (IFSA-EUSFLAT) Chair: Urszula Bentkowska Standard A

SS 1 - Decision Making Under Uncertainty and Fuzzy Optimization: Theory, Algorithms, and Applications

9:10 – 9:30 Optimality conditions for multiobjective fuzzy programming problems
Beatriz Hernández-Jiménez, Rafaela Osuna-Gómez, Yurilev Yalco-Cano and Gabriel Ruíz-Garzón

9:30 – 9:50	A Minimax Criterion Approach to Treat the Inexactness in Feasible Set of a Linear Programming Problem <i>Zhenzhong Gao and Masahiro Inuiguchi</i>
9:50 – 10:10	Learning of Consistent Preference Relations for Decision Making and Optimization in the Context of Interacting Goals <i>Rudolf Felix</i>
10:10 – 10:30	How General Is Fuzzy Decision Making? <i>Olga Kosheleva and Vladik Kreinovich</i>

Session 35 (IJCRS)	Chair: Marko Palangetic	Grand
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9:10 – 9:30	Attention Enhanced Hierarchical Feature Representation for Three-way Decision Boundary Processing <i>Jie Chen, Yue Chen, Yang Xu, Shu Zhao and Yanping Zhang</i>
9:30 – 9:50	Three-way decisions based RNN models for sentiment classification <i>Yan Ma, Jingying Yu, Bojing Ji, Jie Chen, Shu Zhao and Jiajun Chen</i>
9:50 – 10:10	Spark accelerated implementation of parallel attribute reduction from incomplete data <i>Qian Cao, Chuan Luo, Tianrui Li and Hongmei Chen</i>
10:10 – 10:30	An Opinion Summarization-Evaluation System Based on Pre-trained Models <i>Han Jiang, Yubin Wang, Songhao Lv and Zhihua Wei</i>

Session 36 (AGOP)	Chair: Lenka Halčinová	Standard B
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9:10 – 9:30	Orders from Uninorms on Bounded Lattices: Some Perspectives <i>Vikash Kumar Gupta and Balasubramaniam Jayaram</i>
9:30 – 9:50	Order based on Non-Associative Operations <i>Kavit Nanavati and Balasubramaniam Jayaram</i>
9:50 – 10:10	Some investigations on t-norms and t-conorms on an appropriate bounded lattice <i>Emel Aşıcı</i>
10:10 – 10:30	Some conclusions on the direct product of uninorms on bounded lattices <i>Emel Aşıcı and Radko Mesiar</i>

10:30 - 11:00	Coffee break	Foyer
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Session 37 (IFSA-EUSFLAT)	Chair: Vojtěch Molek	Lux
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SS 8 - Fuzzy Methods in Statistics and Data Analysis

11:00 – 11:20	Why kappa regression? <i>Julio Urenda, Orsolya Csiszar, Gabor Csiszar, József Dombi, György Eigner, Olga Kosheleva and Vladik Kreinovich</i>
11:20 – 11:40	In search of a precise estimator based on imprecise data <i>Przemysław Grzegorzewski and Joanna Goławska</i>
11:40 – 12:00	Epistemic bootstrap for fuzzy data <i>Przemysław Grzegorzewski and Maciej Romaniuk</i>
12:00 – 12:20	fIRTree: An Item Response Theory modeling of fuzzy rating data <i>Antonio Calcagni</i>

Session 38 (IFSA-EUSFLAT)		Chair: Jiří Kupka	Standard A
<i>SS 1 - Decision Making Under Uncertainty and Fuzzy Optimization: Theory, Algorithms, and Applications</i>			
11:00 – 11:20	Interactive Decision Making for Multiobjective Bimatrix Games with Fuzzy Payoffs Based on Possibility Measure <i>Hitoshi Yano and Ichiro Nishizaki</i>		
11:20 – 11:40	Against Artificial Complexification: Crisp vs. Fuzzy Information in the TOPSIS Method <i>David Pelta, Maria Teresa Lamata, José Luis Verdegay, Carlos Cruz and Ana Salas</i>		
11:40 – 12:00	Fuzzy equivalences and aggregation functions in decision-making problems <i>Urszula Bentkowska and Anna Król</i>		
12:00 – 12:20	A Granular Consensus Model Based on Intuitionistic Reciprocal Preference Relations and Minimum Adjustment for Multi-Criteria Group Decision Making <i>Francisco Javier Cabrerizo, José Ramón Trillo, Juan Antonio Morente-Molinera, Sergio Alonso and Enrique Herrera-Viedma</i>		
Session 39 (IFSA-EUSFLAT)		Chair: Antonín Dvořák	Classic
<i>Generalized quantifiers and natural language modeling</i>			
11:00 – 11:20	Generalized Peterson's syllogisms with the quantifier "At least several (a few; a little)" <i>Petra Murinová and Vilém Novák</i>		
11:20 – 11:40	On Modelling of Generalized Peterson's Syllogisms with More Premises <i>Karel Fiala, Veronika Červeňová and Petra Murinová</i>		
11:40 – 12:00	Generalized Peterson's Rules in Fuzzy Natural Logic <i>Petra Murinová, Viktor Pavlíška and Michal Burda</i>		
12:00 – 12:20	An Overview of Graded Structures of Opposition with Intermediate Quantifiers <i>Petra Murinová</i>		
Session 40 (IJCRS)		Chair: Olha Kaminska	Grand
11:00 – 11:20	General Rough Modeling of Cluster Analysis <i>A. Mani</i>		
11:20 – 11:40	Determining Tanimoto Similarity Neighborhoods of Real-Valued Vectors by Means of the Triangle Inequality and Bounds on Lengths <i>Marzena Kryszkiewicz</i>		
11:40 – 12:00	DDAE-GAN: Seismic data denoising by integrating autoencoder and generative adversarial network <i>Fan Min</i>		
Session 41 (AGOP)		Chair: Martin Kalina	Standard B
11:00 – 11:20	The Choquet integral in the construction of composite indices: The case of the Society Sustainable Index <i>Patrizia Pérez-Asurmendi and Bonifacio Llamazares</i>		
11:20 – 11:40	Choquet integrals with respect to generalized survival functions <i>Jana Borzová, Lenka Halčinová and Jaroslav Šupina</i>		
11:40 – 12:00	Survival functions based on conditional aggregation operators <i>Stanislav Basarik, Jana Borzová and Lenka Halčinová</i>		
12:00 – 12:20	On a generalization of level measures <i>Michał Boczek, Ondrej Hutník, Marek Kaluszka and Miriam Kleinová</i>		
12:30 - 14:00	Lunch	Hotel restaurant	

Plenary Talk 4	Chair: Irina Perfilieva	Lux
14:00 – 15:00	Handling Uncertainty in Dynamical Systems: Challenges and Opportunities <i>Martine Ceberio</i>	
15:00 - 15:30	Coffee break	Foyer
Session 42 (IFSA-EUSFLAT)	Chair: Katarzyna Kaczmarek-Majer	Lux
<i>SS 8 - Fuzzy Methods in Statistics and Data Analysis</i>		
15:30 – 15:50	Qualitative capacities and their informational comparison <i>Didier Dubois, Francis Faux, Henri Prade and Agnès Rico</i>	
15:50 – 16:10	A fuzzy order for graphs based on the continuous entropy of Gaussian Markov Random Fields (SS 8) <i>Juan Baz, Irene Díaz, Susana Montes and Raúl Pérez-Fernández</i>	
16:10 – 16:30	Conditional interval valued probability and martingale convergence theorem (SS 8) <i>Katarína Čunderlíková</i>	
16:30 – 16:50	Quantile based summation of random variables <i>Kadir Emir, David Kruml, Jan Paseka and Iveta Selingerová</i>	
Session 43 (IFSA-EUSFLAT)	Chair: Vilém Novák	Standard A
<i>SS 7 - Mathematical Fuzzy Logic</i>		
15:30 – 15:50	Some categorical equivalences for Nelson algebras with consistency operators (SS 7) <i>Francesc Esteva, Aldo Figallo-Orellano, Tommaso Flaminio and Lluís Godo</i>	
15:50 – 16:10	Propositional Dynamic Logic over Finite Łukasiewicz Chains (SS 7) <i>Igor Sedlár</i>	
16:10 – 16:30	Approaching the square of oppositions in terms of the f-indexes of inclusion and contradiction <i>Nicolas Madrid and Manuel Ojeda-Aciego</i>	
16:30 – 16:50	On Preservation of Residuated Lattice Properties for Partial Algebras <i>Nhung Cao and Martin Štěpnička</i>	
Session 44 (IFSA-EUSFLAT)	Chair: Allel Hadjali	Classic
<i>SS 5 - Data Management in IoT-based Smart Environments: Leveraging Computational Intelligence for Decision Making (DaMISE'2021)</i>		
<i>SS 9 - Fuzzy Technologies for Web Intelligence and Internet of Things</i>		
15:30 – 15:50	A comparative study of LDA and FLSA for Violence Risk Assessment <i>Emil Rijcken, Uzay Kaymak, Kalliopi Zervanou, Pablo Mosteiro, Marco Spruit and Floortje Scheepers</i>	
15:50 – 16:10	CG2A: Conceptual Graphs Generation Algorithm <i>Adam Faci, Marie-Jeanne Lesot and Claire Laudy</i>	
16:10 – 16:30	A Sentiment-Based Author Verification Model Against Social Media Fraud (SS 5) <i>Khodor Hammoud, Salima Benbernou and Mourad Ouziri</i>	
16:30 – 16:50	Data Fusion in Question Answering Systems over Multiple-Knowledge Bases (SS 9) <i>Nhuan D. To and Marek Z. Reformat</i>	
Session 45 (IJCRS)	Chair: Sheela Ramanna	Grand
15:30 – 15:50	Attribute Reduction Using Functional Dependency Relations in Rough Set Theory <i>Mauricio Restrepo and Chris Cornelis</i>	
15:50 – 16:10	Tolerance-based Twitter Sentiment Classifier: Preliminary Results <i>Vrushang Patel and Sheela Ramanna</i>	

16:10 – 16:30 Mining Incomplete Data Using Global and Saturated Probabilistic Approximations Based on Characteristic Sets and Maximal Consistent Blocks
Patrick Clark, Jerzy Grzymala-Busse, Zdzislaw S. Hippe and Teresa Mroczek

Session 46 (AGOP) **Chair:** Martin Kalina **Standard B**

15:30 – 15:50 On agglomerative hierarchical percentile clustering
Fabrizio Durante, Aurora Gatto and Susanne Saminger-Platz

15:50 – 16:10 Cosmological Clustering: A gravitational clustering approach inspired on large-scale cosmos' structure and dynamics
Aitor Castillo-López, Maria Minárová, Iosu Rodriguez-Martinez, Javier Fumanal-Idocin and Humberto Bustince

16:10 – 16:30 Aggregation of operators in fuzzy relational mathematical morphology: erosion and dilation
Alexaner Šostak and Ingrida Ujjane

16:30 – 16:50 Aggregation operators for comparative possibility distributions and their role in group decision making
Andrey Zubyyuk and Egor Fadeev

18:30 – 23:00 Gala Dinner **Moyzes hall**

Friday **24 September 2021**

Session 47 (IFSA-EUSFLAT) **Chair:** Javier Fernandez **Lux**

Signal processing

9:30 – 9:50 Classification Method of Image Feature Matching Using Naive Bayes Classifier
Jin Yong Kim, Eun Kyeong Kim, Baekcheon Kim, Daekeon Ha and Sungshin Kim

9:50 – 10:10 Distance transformations based on aggregation functions
Sara Iglesias-Rey, Bernard De Baets and Carlos Lopez-Molina

10:10 – 10:30 Feature-based identification of Tau protein in neural tissue
Felipe Antunes-Santos, Carlos Lopez-Molina, Maite Iriarte and Bernard De Baets

10:30 – 10:50 Some Approaches Based on Interval-Valued Images and L-Fuzzy Mathematical Morphology for Segmenting Images Reconstructed from Noisy Sinograms
Peter Sussner, Lisbeth Corbacho Carazas and Eduardo Miqueles

Session 48 (IFSA-EUSFLAT) **Chair:** Jiří Kupka **Standard A**

Basics of fuzzy set theory

9:30 – 9:50 Triangular Fuzzy Relational Products of Level Fuzzy Relations
Nhung Cao and Michal Burda

9:50 – 10:10 Sup-T Compositions of Partial Fuzzy Relations
Libor Běhounek and Martina Daňková

10:10 – 10:30 Consistency in Deducing Redundant Linguistic Fuzzy Rules
Nhung Cao and Radek Valášek

10:30 – 10:50 Fuzzy Metrics for Solving MODM Problems
Olga Grigorenko

Session 49 (IFSA-EUSFLAT) Chair: Vojtěch Molek Standard B

Machine learning and AI

- 9:30 – 9:50** On the use of computational perceptions as labeled datasets in machine learning: a first empirical approximation
Clemente Rubio-Manzano, Tomás Lermada, Claudia Martínez-Araneda, Alejandra Segura-Navarrete and Christian Vidal-Castro
- 9:50 – 10:10** A Semi-Supervised Anomaly Detection Approach in Brain MRI Images including Alzheimer's Disease
Jin-Beom Kim, Nishant Chauhan and Byung-Jae Choi
- 10:10 – 10:30** Multiple Criteria Decision Analysis Based on Ill-known Pairwise Comparison Data
Masahiro Inuiguchi and Shigeaki Innan
- 10:30 – 10:50** From MCDA to Fuzzy MCDA: Fuzzy Extensions of an MCDA Method and Their Distinctions
Alexander Radaev, Alexander Korobov, Boris Yatsalo and Luis Martinez

Session 50 (IFSA-EUSFLAT) Chair: Michal Burda Classic

SS 14 - CI-4-SDG: Computational Intelligence to help reaching the Sustainable Development Goals

- 9:30 – 9:50** Measuring the environmental cost in the evaluation of metaheuristics
Pavel Novoa-Hernández, Amilkar Puris and David Pelta
- 9:50 – 10:10** A Comparative Analysis based on GIS and Fuzzy MCDM Approaches. Case Study: Offshore Wind Site Selection in the Gulf of Maine
Juan Miguel Sánchez-Lozano, Adela Ramos Escudero, Isabel Cristina Gil-García, M. Socorro García-Cascales and Ángel Molina-García
- 10:10 – 10:30** A Case Study of AutoML for Supervised Crash Severity Prediction
Juan S. Angarita-Zapata, Gina Maestre-Gongora and Jenny Fajardo Calderín
- 10:30 – 10:50** A methodology for more sustainable agriculture through early crop frost forecasting
José M. Cadenas, M. Carmen Garrido and Raquel Martínez España

10:50 - 11:20 Coffee break Foyer

Plenary Talk 5 Chair: Radko Mesiar Lux

- 11:20 – 12:20** Fuzzy Implication Functions 2.0: From Theoretical Results to Applications and Vice Versa
Sebastia Massanet

12:20 - 12:40 Closing ceremony Lux

13:00 – 14:00 Lunch Hotel restaurant

18:00 – 22:00 Farewell party 1st Slovak Pub

