

**Monday, June 24, 2013**



**8:45 am – 9:00 am**

---

**Opening session**

room: ETLC E1-003

**9:00 am – 9:50 am**

---

Keynote presentation

**Toward a Restriction-Centered Theory of Truth and Meaning**

Lotfi A. Zadeh

room: ETLC E1-003, chair: Oscar Castillo

**9:50 am – 10:10 am**

---

**Coffee break**

Location: Solarium

**S-35: Data Analysis: Data Imbalance and Outliers**

room: ETLC E1-003, chair: Shun-Feng Su

Robust Radial Basis Function Networks Based on Least Trimmed Squares-Support Vector Regression  
*Shun-Feng Su, Jin Tsong Jeng, Yue-Shiang Liu, Chen-Chia Chung and Imre J. Rudas*

An Extended Numerical Analysis of an Intuitionistic Fuzzy Classifier for Imbalanced Classes  
*Eulalia Szmidt, Janusz Kacprzyk and Marta Kukier*

Evolutionary Fuzzy Classifiers for Imbalanced Datasets: An Experimental Comparison  
*Michela Antonelli, Pietro Ducange, Francesco Marcelloni and Armando Segatori*

**S-44: Evolutionary Computing: Fuzzy and Granular based Systems**

room: ETLC E1-017, chair: Ricardo Tanscheit

Convergence Analysis of an Elitist Non-homogeneous Genetic Algorithm with Mutation  
Probability Adjusted by a Fuzzy Controller  
*André G. C. Pereira, Jose A.F. Roveda, Luiz Amorim Carlos,  
Viviane Simioli Medeiros Campos and Sandra R.M.M. Roveda*

A New Granular Particle Swarm Optimization Variant for Granular Optimization Problems  
*Guohua Wu, Witold Pedrycz, Dishan Qiu and Manhao Ma*

A Quantum-inspired Evolutionary Algorithm for Fuzzy Classification  
*Waldir Nunes, Marley Vellasco and Ricardo Tanscheit*

**S-18: Mathematics I**

room: NREF 2-001, chair: Wang Xueping

Dimensions of L-semilinear Spaces over Zerosumfree Eemirings  
*Shu Qianyu and Wang Xueping*

Quantitative Domains via Fuzzy Sets: Locally order Preserving Functors  
*Su Shuhua, Li Qingguo and Chen Huodi*

Reflective Categories of Cut Systems and Fuzzy Sets in  $\Omega$ -sets  
*Jiří Močkoř*

**S-27: Fuzzy Sets and Fuzzy Ideas**

room: NREF 2-003, chair: Nick J. Pizzi

Generating Embedded Type-1 Fuzzy Sets by means of Convex Combination  
*Omar Salazar and Jairo Soriano*

Pythagorean Fuzzy Subsets  
*Ronald R. Yager*

On Properties of Fuzzy Ideals  
*Flaules Boone Bergamaschi and Regivan H. N. Santiago*

**S-39: Data Analysis: Grouping and Feature Selection**

room: ETLC E1-003, chair: Guoqing Chen

Big Data Granulation Challenges

*Marcin Kowalski and Dominik Slezak*

An evolutionary fuzzy system for the detection of exceptions in subgroup discovery

*Cristóbal J. Carmona, Pedro González, María José Del Jesus,*

*Beatriz García-Domingo and Jorge Aguilera*

Optimized Feature Selection using Neuroevolution of Augmenting Topologies (NEAT)

*Soroosh Sohangir, Shahram Rahimi and Bidyut Gupta*

**S-22: Rough Sets**

room: ETLC E1-017, chair: Michinori Nakata

Neighborhood Rough Sets based Multi-label Classification

*Ying Yu, Witold Pedrycz, Duoqian Miao and Hongyun Zhang*

Rule Induction Based on Rough Sets from Information Tables Containing

Possibilistic Information

*Michinori Nakata and Hiroshi Sakai*

**S-19: Mathematics II**

room: NREF 2-001, chair: Jerry M. Mendel

Centroids of Fuzzy Sets When Membership Functions Have Spikes

*Janet Aisbett and John T. Rickard*

Combining Chain-Ladder Claims Reserving with Fuzzy Numbers

*Jochen Heberle and Anne Thomas*

Linguistic Weighted Standard Deviation

*Minshen Hao and Jerry M. Mendel*

**FS-25: Fuzziness and Medicine I**

room: NREF 2-003, chair: Rudi Seising

A Fuzzy Structuralist View on the Analytical Philosophy of Medicine

*R. Seising*

Compressing the representation of a causal graph

*C. Puente, E. Garrido, J. A. Olivas and R. Seisdedos*

A Public Health Decision Support System Framework Using

Approximate Reasoning methods

*Nick. J. Pizzi*

**12:10 pm – 1:15 pm**

---

**Lunch**

Location: Solarium

**1:15 pm – 1:45 pm**

---

Special Lecture

**Memories of Professors Kiyoji Asai and Hideo Tanaka (Part I)**

room: ETLC E1-003, chairs: Weldon A. Lodwick and Masahiro Inuiguchi

**1:45 pm – 2:45 pm**

---

Special Lecture

**Memories of Professors Kiyoji Asai and Hideo Tanaka (Part II)**

room: ETLC E1-003, chairs: Weldon A. Lodwick and Masahiro Inuiguchi

**2:45 pm – 3:45 pm**

---

**FS-38: Optimization under Flexibility and Generalized Uncertainty I**

room: ETLC E1-003, chairs: Weldon A. Lodwick and Masahiro Inuiguchi

Possibilistic Stackelberg Solutions to Bilevel Linear Programming Problems with Fuzzy Parameters  
*H. Katagiri, K. Kato and T. Uno*

Route Planning Problem under Fuzzy Sightseeing Times and Satisfaction Values of Sightseeing Places  
*T. Hasuike, H. Katagiri, H. Tsubaki and H. Tsuda*

Channel Coordination in the Supply Chain with the One-shot Decision Theory  
*X. Ma, C. Wang and P. Guo*

**S-26: Fuzzy Lattices**

room: ETLC E1-017, chair: Ivan Mezzomo

Operations on Bounded Fuzzy Lattices  
*Ivan Mezzomo, Benjamin Bedregal and Regivan H. N. Santiago*

alpha-Ideals of Fuzzy Lattices  
*Ivan Mezzomo, Benjamin Bedregal and Regivan H. N. Santiago*

### **S-20: Mathematics III**

room: NREF 2-001, chair: *Carol Walker*

Partial Orders on the Truth Value Algebra of Finite Type-2 Fuzzy Sets  
*John Harding, Carol Walker and Elbert Walker*

Fixed Point Theorems in Fuzzy Metric Spaces  
*Shaban Sedghi*

The design of a CUSUM control chart for LR-fuzzy data  
*Dabuxilatu Wang and Olgierd Hryniewicz*

### **FS-26: Fuzziness and Medicine II**

room: NREF 2-003, chair: *Mila Kwiatkowska*

Context Modeling for the Clinical Predictors of Obstructive Sleep Apnea  
*M. Kwiatkowska, J. Matthews and L. Matthews*

A Preliminary Fuzzy Model for Screening Obstructive Sleep Apnea  
*J. M. Matthews, M. Kwiatkowska and L. R. Matthews*

Fuzzy Braunwald–Modified Chest Pain Assessment for Unstable Angina  
*Angela S. K. Takesaki, Ernesto Araujo, Ricardo Simoes and Reinaldo G. I. Arakaki*

**3:45 pm – 4:05 pm**

---

#### **Coffee break**

Location: Solarium

**4:05 pm – 5:05 pm**

---

### **FS-39: Optimization under Flexibility and Generalized Uncertainty II**

room: ETLC E1-003, chairs: *Weldon A. Lodwick and Masahiro Inuiguchi*

Consumption-Investment Problems with the One-Shot Decision Theory  
*Y. Li, P. Guo*

The Karush-Kuhn-Tucker Optimality Conditions for a Class of Fuzzy Optimization problems using strongly generalized derivative  
*Y. Chalco-Cano, W. A. Lodwick and H. Roman-Flores*

Necessary Efficiency is Partitioned into Possible and Necessary Optimality  
*M. Inuiguchi*

### **S-34: Formal Concept Analysis and Petri Nets**

room: ETLC E1-017, chair: Jan Konecny

Formal Concept Analysis on Fuzzy Sets  
*Lili Shen and Dexue Zhang*

Toward Reduction of Formal Fuzzy Context  
*Radim Belohlavek and Jan Konecny*

Linear-Algebraic Representation of Generalised Fuzzy Petri Nets  
*Zbigniew Suraj*

### **S-33: Risk Management**

room: NREF 2-001, chair: Xiaodong Liu

Construction Project Risk Assessment Using Combined Fuzzy and FMEA  
*Amir Mohammadi and Mehdi Tavakolan*

A Relationship Hierarchy Structural Fuzzy ANP Model to Explore Development of Marketing Strategic Alliances  
*Tsuen-Ho Hsu and Jia-Wei Tang*

Interval-based Analysis of BOCR (Benefits, Opportunities, Costs and Risks)  
Models Evaluated by Multiple Experts  
*K. Krishna Mohan, Marek Z. Reformat, and Witold Pedrycz*

### **FS-27: Fuzziness and Medicine III**

room: NREF 2-003, chair: Rudi Seising

A Decision Support System for ICU Readmissions Prevention  
*Susana M. Vieira, Joao P. Carvalho, Andre S. Fialho, S. R. Reti,  
S. N. Finkelstein and Joao M.C. Sousa*

Acceptability and Difficulties of (Fuzzy) Decision Support Systems in Clinical Practice  
*Christian J. Schuh, Jeroen S. de Bruin and Walter Seeling*

**5:30 pm**

---

### **Welcome Reception**

Location: Solarium



9:00 am – 9:50 am

---

Keynote presentation

**Bio-Inspired Optimization of Type-2 Fuzzy Systems  
in Intelligent Control Applications**

Oscar Castillo

room: ETLC E1-003, chair: Janusz Kacprzyk

9:50 am – 10:10 am

---

**Coffee break**

Location: Solarium

10:10 am – 11:10 am

---

**FS-40: Optimization under Flexibility and Generalized Uncertainty III**

room: ETLC E1-003, chairs: Weldon A. Lodwick and Masahiro Inuiguchi

Optimization of Value-at-Risk Portfolios in Uncertain Lognormal Models

*Y. Yoshida*

Relative evaluation of criteria for cooperative interval AHP in group decision making

*T. Entani*

Professors Kiyoji Asai and Hideo Tanaka's first flexible/possibilistic optimization approaches revisited

*W. A. Lodwick and M. Inuiguchi*

**S-43: Optimization Algorithms in Fuzzy System Development**

room: ETLC E1-017, chair: Emil Petriu

Constructing Dense Fuzzy Systems by Adaptive Scheduling of Optimization Algorithms

*Krisztián Balázs and László T. Kóczy*

Simulated Annealing-Based Optimization of Fuzzy Models for Magnetic Levitation Systems

*Claudia-Adina Dragos, Radu-Emil Precup, Radu-Codrut David, Emil Petriu,*

*Stefan Preitl and Alexandra-Iulia Stinean*

Multi-objective Iterative Genetic Approach for Learning Fuzzy Classification Rules with  
Semantic-based Selection of the Best Rule

*Edward C. Hinojosa and Heloisa A. Camargo*

### **S-31: Recognition of Human Features**

room: NREF 2-001, chair: Patricia Melin

Hierarchical Genetic Algorithm for Type-2 Fuzzy I: Patricia Melin integration applied to Human Recognition  
*Daniela Sanchez and Patricia Melin*

Dental Classification for Periapical Radiograph based on Multiple Fuzzy Attribute

*Martin L. Tangel, Chastine Fatichah, Fei Yan, Janet P. Betancourt,  
M. Rahmat Widyanto, Fangyan Dong and Kaoru Hirota*

Face Recognition based on Fuzzy Probabilistic SOM

*Laura Lanzarini, Franco Ronchetti, César Estrebou,  
Aurelio Fernandez Bariviera and Luciana Lens*

### **S-04: Linguistic Quantifiers**

room: NREF 2-003, chair: Yongming Li

Intuitionistic Fuzzy Choquet Integrals and their Application in Modeling Linguistic Quantifiers

*Yongming Li and Lu Li*

A Linguistic Quantifier-Based Approach for Skyline Refinement

*Katia Abbaci, Allel Hadjali, Ludovic Liétard and Daniel Rocacher*

Modeling Linguistic Probabilities and Linguistic Quantifiers Using Interval Type-2 Fuzzy Sets

*Mohammad Reza Rajati and Jerry M. Mendel*

**11:10 am – 12:10 pm**

---

### **S-25: Interval Valued Fuzzy Systems: Applications**

room: ETLC E1-003, chair: Peter Sussner

Some Results of Interval-valued fuzzy relational equations with sup-conjunctive composition

*Xiong Qingquan and Wang Xueping*

Box Math and KSM: Extending Sherman--Morrison to Functions of Interval Matrices

*Ralph Kelsey*

Interval-Valued Fuzzy Associative Memories Based on Representable Conjunctions  
with Applications in Prediction

*Peter Sussner and T Schuster*

### **S-24: Rule-based Systems: Rule Mining and Applications**

room: ETLC E1-017, chair: Margaret F. Shipley

Determining Beach Closures Necessary to Protect Bull Shark (*Carcharhinus leucas*)  
Species (and Bathers): A Fuzzy Rule-Based Model

*Margaret F. Shipley and J. Brooke Shipley-Lozano*



Mining Fuzzy Rules Based on Pattern Trees  
*Xinghua Feng and Xiaodong Liu*

A Fuzzy-Genetic System for Rule Extraction from Support Vector Machines  
*Cintia F. F. Carraro, Marley Velasco and Ricardo Tanscheit*

**S-45: Fuzzy Modeling**

room: NREF 2-001, chair: Fernando Gomide

Approximation Properties of Higher Order Takagi-Sugeno Fuzzy Systems  
*Barnabas Bede and Imre J. Rudas*

Fuzzy Relational Structures: Learning Alternatives for Fuzzy Modeling  
*Orion Fausto Reyes-Galaviz and Witold Pedrycz*

Fuzzy Systems Modeling with Participatory Evolution  
*Yi Ling Liu and Fernando Gomide*

**S-46: Similarity Measures**

room: NREF 2-003, chair: Valerie Cross

Intuitive Decision-Making Using Hyper Similarity Matching  
*Ronald R. Yager and Fred E. Petry*

A Similarity Measure with Uncertainty for Incompletely Known Fuzzy Sets  
*Anna Stachowiak and Krzysztof Dyczkowski*

Fuzzy Semantic Similarity in Linked Data using Wikipedia Infobox  
*Parisa D. Hossein Zadeh and Marek Z. Reformat*

**12:10 pm – 1:15 pm**

---

**Lunch**

Location: Solarium

**1:15 pm – 1:45 pm**

---

Special Lecture

**Techniques of Fuzzy Natural Logic in Modelling**

Vilem Novak

room: ETLC E1-003, chair: Patricia Melin

1:45 pm – 2:45 pm

---

**FS-04: Computational Intelligence Techniques for Smart Grids Control and Management**

room: ETLC E1-003, chair: Enrico De Santis

Two Evolutionary Computation Approaches for Active Power Losses Minimization in Smart Grids

*F. Possemato, G. L. Storti, M. Paschero, A. Rizzi and F. M. F. Mascioli*

Optimal Distribution Feeders Configuration for Active Power Losses Minimization by Genetic Algorithms

*G. L. Storti, F. Possemato, M. Paschero, A. Rizzi and F. M. F. Mascioli*

Genetic Optimization of a Fuzzy Control System for Energy Flow Management in Micro-Grids

*E. De Santis, A. Rizzi, A. Sadeghian and F. M. F. Mascioli*

**S-21: Classification and Detection**

room: ETLC E1-017, chair: László T. Kóczy

The Design of Fuzzy C-Means Clustering based Neural Networks for Emotion Classification

*Byoung-Jun Park, Eun-Hye Jang, Sang-Hyeob Kim, Chul Huh and Myoung-Ae Chung*

A new Approach based on Generalized Type-2 Fuzzy Logic for Edge Detection

*Claudia I. Gonzalez, Juan R. Castro, Gabriela E. Martinez, Patricia Melin and Oscar Castillo*

Improved Fuzzy-Based Single-Stroke Character Recognizer

*Alex Tormási and László T. Kóczy*

**FS-01: Soft approaches to advanced Web Information Retrieval I**

room: NREF 2-001, chair: Jose Angel Olivas

An approach to improve semantics in Smart Spaces using reactive fuzzy rules

*Natalia Díaz Rodríguez, Johan Lilius, Manuel Pegalajar Cuéllar and Miguel Delgado Calvo-Flores*

Semantic Similarity Measure in Ontology Alignment

*Valerie Cross, P. Silwal and Xi Chen*

Searching optimal product bundles by means of GA-based Engine and Market Basket Analysis

*C. Birtolo, D. D. Chiara, S. Losito, P. Ritrovato and M. Veniero*

**FS-08: Inter-Relation between Interval and Fuzzy Techniques I**

room: NREF 2-003, chair: Vladik Kreinovich

Estimating Third Central Moment C3 for Privacy Case under Interval and Fuzzy Uncertainty

*A. Jalal-Kamali and V. Kreinovich*

An Overview of the Upcoming IEEE P-1788 Working Group Document: Standard for Interval Arithmetic

*R. B. Kearfott*

Back to the Future: Advanced Control Techniques Justify—on a New Level—Traditional Education Practices

*O. Kosheleva, K. Villaverde and S. D. Cabrera*

2:45 pm – 3:45 pm

---

**FS-18: Fuzzy Logic in Economics and Social Sciences I**

room: ETLC E1-003, chair: Rudi Seising

Fuzzy Theory in Cognition, Economic Man and Organization Behavior  
*F. S. Nobre*

Towards Intelligent Mining of Public Social Networks' Influence in Society  
*J.P. Carvalho, V. C. Pedro and F. Batista*

Quality of work and elderly care - Preliminary experiments  
*G. Facchinetti, G. Solinas and T. Pirotti*

**S-23: Clustering and Classification**

room: ETLC E1-017, chair: Qiang Wei

A Novel Fuzzy Associative Classifier Based on Information Gain and Rule-Covering  
*Yue Ma, Guoqing Chen and Qiang Wei*

Theoretical Examination of Clustering Structure in Fuzzy Joint Points Method  
*Gözde Ulutağay*

From Clustering to Granular Clustering: A Granular Representation of Data  
in Pattern Recognition and System Modeling  
*Adam Gacek*

**FS-02: Soft approaches to advanced Web Information Retrieval II**

room: NREF 2-001, chair: Jose Angel Olivas

Clustering of Web Search Results based on an Iterative Fuzzy C-means Algorithm  
and Bayesian Information Criterion  
*C. Cobos, M. Mendoza, E. León, M. Manic, E. Herrera-Viedma*

Creating a Natural Language Summary from a Compressed Causal Graph  
*C. Puente, E. Garrido, J. A. Olivas, R. Seisdedos*

Enhancing Knowledge Management Capabilities in Web-based Decision Aids using  
Fuzzy Prototypes and Data Quality Criteria  
*Francisco P. Romero, Jose A. Olivas Ismael Caballero, Jesus Serrano-Guerrero and Mauro J. Oruezabal*

**FS-09: Inter-Relation Between Interval and Fuzzy Techniques II**

room: NREF 2-003, chair: Vladik Kreinovich

Likert-Scale Fuzzy Uncertainty from a Traditional Decision Making Viewpoint:  
It Incorporates Both Subjective Probabilities and Utility Information  
*J. Lorkowski and V. Kreinovich*

Sparse Fuzzy Techniques Improve Machine Learning  
*R. Sanchez, C. Servin and M. Argaez*

Towards Fuzzy Method for Estimating Prediction Accuracy for Discrete Inputs,  
with Application to Predicting At-Risk Students  
*X. Wang, M. Ceberio and A. F. G. Contreras*

**3:45 pm – 4:05 pm**

---

**Coffee break**

Location: Solarium

**4:05 pm – 5:25 pm**

---

**FS-19: Fuzzy Logic in Economics and Social Sciences II**

room: ETLC E1-003, chair: Rudi Seising

An Overview of Fuzzy–Logic Based Approaches to Ecology: Addressing Uncertainty

*F. A. Pouw and M. Kwiatkowska*

Ordered Fuzzy Numbers in Financial Stock and Scouting Problems

*W. Kosinski and A. Chwastyk*

How to Face the Arab Spring using Fuzzy Logic

*G. Facchinetti, G. Mastroleo and G. Ricci*

Reduction Fuzzy Social Computing for Gross National Income  
Cross–Country Comparison

*E. Araujo*

**FS-29: Approx.-related Solutions for Big and Complex Data Challenges**

room: ETLC E1-017, chair: Marcin Szczuka

A Granular Recursive Fuzzy Meta-clustering Algorithm for Social Networks

*Kishore Rathinavel and Pawan Lingras*

Growing Rule-based Fuzzy Model Developed with the Aid of Fuzzy Clustering

*W.-D. Kim, S.-K. Oh, K.-S. Seo and W. Pedrycz*

How Deep Data Becomes Big Data

*Marcin Szczuka and Dominik Slezak*

Finding an  $\lambda$ -Representative Subset from Massive Data

*Jin Zhang, Qiang Wei and Guoqing Chen*

**FS-11: Models and Methods of Optimization and Decision Making  
in Fuzzy Environment and Their Applications**

room: NREF 2-001, chair: Petr Ekel

A note on "Solving Fuzzy Linear Programming Problems with Interval Type-2 RHS"

*J. C. F. Garcia and G. Hernandez*

Solving Multiobjective Programming Problems With Fuzzy Objective Functions

*M. K. Luhandjula*

Fuzzy Set Based Multicriteria Decision Making in Power Engineering Problems

*G. B. Alves, P. Ya. Ekel, I. V. Kokshenev, R. O. Parreiras, H. S. Schuffner and P. M. N. Souza*

A Proposal of a Linguistic Group Decision Model to Support Public Decisions in Brazil

*V. B. S. Silva and D. C. Morais*

**FS-10: Inter-Relation Between Interval and Fuzzy Techniques III**

room: NREF 2-003, chair: Olga Kosheleva

Data Anonymization that Leads to the Most Accurate Estimates of  
Statistical Characteristics: Fuzzy-Motivated Approach

*G. Xiang, S. Ferson, L. Ginzburg, L. Longpre, E. Mayorga and O. Kosheleva*

How to Generate Worst-Case Scenarios When Testing Already Deployed  
Systems Against Unexpected Situations

*F. Zapata, R. Pineda and M. Ceberio*

Solving Linear Programming Problems with Interval Type-2 Fuzzy Constraints  
using Interval Optimization

*Juan Carlos Figueroa Garcia and German Hernandez*

The Negation in the Checklist Paradigm based  $m_2$  Non-Commutative  
Fuzzy Interval Logic System of Goguen and Gaines

*Eunjin Kim*





9:00 am – 9:50 am

---

Keynote presentation

**Fuzzy Visualization Method of Atmosfield and Kansei-Texture**

Kaoru Hirota and Fangyan Dong

room: ETLC E1-003, chair: Jerry M. Mendel

9:50 am – 10:10 am

---

**Coffee break**

Location: Solarium

10:10 am – 11:10 am

---

**S-08: Time Series: Forecasting**

room: ETLC E1-003, chair: Jun Zhao

Neural Network with Lower and Upper Type-2 Fuzzy Weights  
using the Backpropagation Learning Method  
*Fernando Gaxiola, Patricia Melin and Fevrier Valdez*

A Gaussian Process Echo State Networks Model for Time Series Forecasting  
*Ying Liu, Jun Zhao and Wei Wang*

The Linguistic Forecasting of Time Series based on Fuzzy Cognitive Maps  
*Wei Lu, Jianhua Yang and Xiaodong Liu*

**FS-22: Soft Computing Models for Engineering, Industrial  
and Environmental Applications I**

room: ETLC E1-017, chair: Petr Musilek

Design of Face Recognition Algorithm Realized with Feature Extraction  
from 2D-LDA and Optimized Polynomial-based RBF NNs  
*S.-H. Yoo, S.-K. Oh and W. Pedrycz*

Optimizing Fuzzy Control of Energy Harvesting Remote Monitoring Systems  
*A. G. Watts, P. Musilek and L. Wyard-Scott*

Non-parametric Interval Forecast Models from Fuzzy Clustering of Numerical Weather Predictions  
*A. Zarnani and P. Musilek*

## **FS-20: Soft Computing in Science and Technology Studies I**

room: NREF 2-001, chair: Rudi Seising

The Fuzzy Set of Computer Science  
*R. Seising*

Technology and human sciences: a dialogue to be constructed  
or a common tread to be rediscovered?

*F. A. D'Asaro, V. Perticone, M. E. Tabacchi and S. Termini*

Quest for Rigorous Intelligent Tutoring Systems under Uncertainty:  
Computing with Words and Images

*B. Kovalerchuk*

## **S-28: Fuzzy Sets in Social Networks**

room: NREF 2-003, chair: John T. Rickard

Perceptual Computing in Social Networks  
*John T. Rickard and Ronald R. Yager*

Using Tagging in Social Networks to Find Groups of Compatible Users  
*Marek Z. Reformat and Ronald R. Yager*

**11:10 am – 12:10 pm**

---

## **S-07: Fuzzy Trees: Basics and Applications**

room: ETLC E1-003, chair: Heloisa A. Camargo

Fuzzy regular tree expressions  
*Xiaofeng Huang, Zhiwen Mo and Lan Shu*

A comparative analysis of pruning strategies for fuzzy decision trees  
*Mariana V. Ribeiro, Heloisa A. Camargo and Marcos E. Cintra*

Fuzzy Pattern Trees as an Alternative to Rule-based Fuzzy Systems: Knowledge-driven, Data-driven and  
Hybrid Modeling of Color Yield in Polyester Dyeing  
*Maryam Nasiri, Thomas Foer, Robin Senge and Eyke Hüllermeier*

## **FS-23: Soft Computing Models for Engineering, Industrial and Environmental Applications II**

room: ETLC E1-017, chair: Vilem Novak

Identification of Atmospheric Pressure Troughs using Image Processing Techniques  
*Y. Li, P. Musilek and E. Lozowski*



An Image Recognition Approach to Classification of Jewelry Stone Defects

*P. Hurtik, M. Burda and I. Perfilieva*

Recognition of Distorted Characters Printed on Metal using Fuzzy Logic Methods

*V. Novak, P. Hurtik and H. Habiballa*

**FS-21: Soft Computing in Science and Technology Studies II**

room: NREF 2-001, chair: Rudi Seising

A Very Brief History of Soft Computing: Fuzzy Sets, Artificial Neural Networks  
and Evolutionary Computation

*R. Seising and M. E. Tabacchi*

Twenty Years Later: Remarks on a Polemic

*E. Trillas*

**FS-12: Recommender and decision systems with soft computing I**

room: NREF 2-003, chair: Jie Lu

An Algorithm for Routes Recommendation Service Based on the Radio-Frequency  
Identification Application

*Y. Zhao, X. Gao and S. Wu*

An Online Fuzzy Decision Support System for Resource Management in Cloud Environments

*F. Ramezani, J. Lu and F. Hussain*

An Intelligent Recommender System for Personalized Fashion Design

*X. Zeng, L. Koehl, L. Wang and Y. Chen*

**12:10 pm – 1:15 pm**

---

**Lunch**

Location: Solarium

**1:15 pm – 1:45 pm**

---

Special Lecture

**Soft Computing in/by Analytics**

Christer Carlsson

room: ETLC E1-003, chair: Oscar Castillo

**1:45 pm – 2:15 pm**

---

Special Lecture

**Fuzzy Information Retrieval: One Man's Journey**

Donald H. Kraft

room: ETLC E1-003, chair: Ronald R. Yager

**2:15 pm – 2:45 pm**

---

Special Lecture

**BCI – Bio-Computational Intelligence vs Brain Computer Interface**

Chin-Teng Lin

room: ETLC E1-003, chair: Ronald R. Yager

**2:45 pm – 3:15 pm**

---

Special Lecture

**Type 1 to Full Type 2, ... Full Type n Fuzzy System Models**

I. Burhan Türkşen

room: ETLC E1-003, chair: Guoqing Chen

**3:15 pm – 4:15 pm**

---

**FS-03: Computing with words in decision making:  
Foundations, models and applications**

room: ETLC E1-003, chairs: Luis Martinez and Rosa Rodriguez

Fuzzy Love Selection by Means of Perceptual Computing

*M. M. Korjani and J. M. Mendel*

Eliciting Comparative Linguistic Expressions in Group Decision Making

*R.M. Rodriguez, L. Martinez and F. Herrera*

Fuzzy Linguistic Multicriteria Morphological Analysis in Scenario Planning

*P. J. Villacorta, A. D. Masegosa and M. T. Lamata*

**FS-24: Soft Computing Models for Engineering, Industrial  
and Environmental Applications III**

room: ETLC E1-017, chair: Irina Perfilieva

Classification of Damages on Jewelry Stones: Preprocessing

*I. Perfilieva, P. Hodakova, M. Vajgl and M. Dankova*

Comparison of Fuzzy Rules and SVM Approach to the Value Estimation of the Use Case Parameters

*J. Štolfa, O. Koběský, P. Krömer, S. Štolfa, M Kopka and V. Snášel*

**S-29: Optimization: Location, Allocation and Transportation**

room: NREF 2-001, chair: László T. Kóczy

Facility Location Problems with Fuzzy Demands Based on Parametric Assessment

*Pei-Chun Lin, Junzo Watada and Berlin Wu*

Using the Fuzzy Sets Theory in the Multimodal Transport Network Problem

*Juliana Verga, Ricardo Coelho Silva, Akebo Yamakami and Wesley V. I. Shirabayashi*

Solution of a Fuzzy Resource Allocation Problem by Various Evolutionary Approaches

*Zsolt Dányádi, Péter Földesi and László T. Kóczy*

**FS-13: Recommender and decision systems with soft computing II**

room: NREF 2-003, chair: Luiz Martinez

A Fuzzy Tree Similarity Based Recommendation Approach for Telecom Products

*D. Wu, G. Zhang and J. Lu*

An Approach for Incremental Maintenance of Approximations in Set-valued  
Ordered Decision Systems while Updating Criteria Values

*C. Luo, L. Lu, T. Li, A. Zeng and H. Chen*

A hybrid model for migrating customer segmentation with missing attributes

*J. Ma, H. Lin, J. Lu and G. Zhang*

**4:15 pm – 4:35 pm**

---

**Coffee break**

Location: Solarium

4:35 pm – 5:35 pm

---

**S-15: Medical Applications**

room: ETLC E1-003, chair: Javier Montero

Using a Semisupervised Fuzzy Clustering process for Identity Identification in Digital Libraries

*Irene Diaz-Valenzuela, Maria J.Martin-Bautista and M. Amparo Vila*

Predicting the Outcome of Brace Treatment for Scoliosis Using Conditional Fuzzy Clustering

*Eric Chalmers, Witold Pedrycz and Edmond Lou*

**S-17: Concepts, Ontology, and Graphs**

room: ETLC E1-017, chair: Mark Wierman

Applications of Realizable Boolean Matrices in Graph Theory

*Feng Sun, Xiao-Bing Qu, Tian-Fei Wang and Xue-Ping Wang*

OWAD Operators in Type-2 Fuzzy Ontologies

*Jozsef Mezei and Robin Wikström*

Psychologists: Are They Logically Fuzzy?

*Mark Wierman*

**FS-15: Type-2 Fuzzy Sets in Data Granulation**

room: NREF 2-001, chair: Lorenzo Livi

Aggregating  $\alpha$ -planes for Type-2 Fuzzy Set Matching

*L. Livi, H. Tahayori, A. Sadeghian and A. Rizzi*

Matching General Type-2 Fuzzy Sets by Comparing the Vertical Slices

*A. Rizzi, L. Livi, H. Tahayori and A. Sadeghian*

**FS-14: Recommender and decision systems with soft computing III**

room: NREF 2-003, chair: Xiaodong Liu

Managing Natural Noise in Collaborative Recommender Systems

*R. Y. Toledo, L. M. López and Y. C. Mota*

Statistical Fault Localization in Decision Support System Based on Probability Distribution Criterion

*P. Hao, Z. Zheng, Y. Gao and Z. Zhang*

6:00 pm

---

**Banquet**

Location: Fort Edmonton



9:00 am – 9:50 am

---

Keynote Presentation:

**A Special Role of Usuality Qualification in Computing  
with Words: Applications in Multiple Problem Areas**

Janusz Kacprzyk

room: ETLC E1-003, chair: Javier Montero

9:50 am – 10:10 am

---

**Coffee break**

Location: Solarium

10:10 am – 11:10 am

---

**S-30: Neural Fuzzy Systems and FCM**

room: ETLC E1-003, chair: Joao Carvalho

An Interval Type-2 Neural Fuzzy Inference System (IT2NFIS) with Compensatory Operator  
*Yang-Yin Lin, Jyh-Yeong Chang and Chin-Teng Lin*

Advanced Learning of Fuzzy Cognitive Maps of Waste Management by Bacterial Algorithm  
*Adrienn Buruzs, Miklós Ferenc Hatwágner, Claudiu Radu Pozna and László T. Kóczy*

Networked Fuzzy Belief Rule-Based System for Spatiotemporal Monitoring  
*Farzad Aminravan, Rehan Sadiq, Mina Hoorfar, Manuel J. Rodriguez, Alex Francisque and Homayoun Najjaran*

**S-41: Mamdani and PDI Controllers, and Educational System**

room: ETLC E1-017, chair: Hao Ying

The Look-up Table Controllers and a Particular Class of Mamdani Fuzzy Controllers  
Are Equivalent – Implications to Real-World Applications  
*Dimitar Filev and Hao Ying*

Fuzzy systems of Mamdani type in the LU representation  
*Matthew P. Peterson, Barnabas Bede and Luciano Stefanini*

Cybernetic Theory of Informational Modeling of Teacher's  
Behavior in the Learning Process based on Fuzzy Logic  
*Shahnaz N. Shahbazova*

**S-02: Computing With Words and Prepositions**

room: NREF 2-001, chair: Julia M. Tylor

Towards Retranslation of Fuzzy Values in Computing with Words  
*Nina Marhamati, Purvag Patel, Elham S. Khorasani and Shahram Rahimi*

Computing with Prepositions: Syntax  
*Lauren M. Stuart, Julia M. Taylor and Victor Raskin*

Computing With Prepositions: Fuzzy Semantics  
*Julia M. Taylor, Victor Raskin and Lauren M. Stuart*

**FS-16: Consensus and Decision Making Under Uncertainty I**

room: NREF 2-003, chairs: Francisco Chiclana and Francisco Javier Cabrerizo

Selecting the Best Taste: a Group Decision-making Application to Chocolates Design  
*N. Agell, G. Sanchez, M. Sanchez and F. Javier Ruiz*

Challenges and Open Questions in Soft Consensus Models  
*F.J. Cabrerizo, F. Chiclana, M.R. Urena and E. Herrera-Viedma*

Fuzzy Reasoning for Medical Diagnosis based on Subjective Attributes and Objective Attributes Alignment  
*H. Fujita*

**11:10 am – 12:10 pm**

---

**S-16: Data Analysis**

room: ETLC E1-003, chair: Takeshi Furuhashi

Fuzzy Granular Principal Curves Algorithm for Large Data Sets  
*Hongyun Zhang, Witold Pedrycz and Duoqian Miao*

A Visualization Method of Third-Order Tensor for Knowledge Extraction from Questionnaire Data  
*Hiroaki Masai, Tomohiro Yoshikawa and Takeshi Furuhashi*

On Soft Measurements and Data Mining Based on Granular Pragmatics, Multi-Valued and Fuzzy Logics  
*Valery B. Tarassov and Maria N. Svyatkina.*

**S-05: Regression Analysis and Optimization**

room: ETLC E1-017, chair: Przemyslaw Grzegorzewski

Granular Regression  
*Przemyslaw Grzegorzewski*

Outlier Detection Approaches in Fuzzy Regression Models  
*Chao Wang and Peijun Guo*

On Pseudo Gradient Search for Solving Nonlinear Multiregression with the Choquet Integral  
*Bo Guo, Li Zhang-Westman and Zhenyuan Wang*

**FS-33: Fuzzy Intelligent Agent Systems I**

room: NREF 2-001, chair: I. Burhan Türkşen

A Type 2 Fuzzy Multi Agent based System for Scheduling of Steel Production  
*M. H. Fazel Zarandi and F. Kashani Azad*

A New Diamond Shape Architecture based on Multi Agents for Supply Chain in an uncertain Environment  
*M.H Fazel Zarandi, B.Bahrami, M.Sayad and I.B. Türkşen*

A Fuzzy Hybrid Intelligent Agent System for Mitigating Demand Amplification in  
Supply Chain of Steel Manufacturing  
*R. Gamasae and M.H. Fazel Zarandi*

**FS-17: Consensus and Decision Making Under Uncertainty II**

room: NREF 2-003, chairs: Francisco Chiclana and Francisco Javier Cabrerizo

Consensus-based Hierarchical Agglomerative Clustering in the Context of Weak Orders  
*J. L. Garcia-Lapresta and D. Perez-Roman*

Aggregating fuzzy implications to measure group consensus  
*G. Beliakov, S. James and T. Calvo*

**12:10 pm – 1:15 pm**

---

**Lunch**

Location: Solarium

**1:15 pm – 1:45 pm**

---

Special Lecture

**Special Lecture: Fuzzy Logic as a geometry**

Antonio Di Nola

room: ETLC E1-003, chair: Javier Montero

**1:45 pm – 2:45 pm**

---

**S-09: Aggregation**

room: ETLC E1-003, chair: John T. Rickard

New Classes of Threshold Aggregation Functions Based upon the Tsallis q-Exponential  
*John T. Rickard and Janet Aisbett*

On Consistent Induced Matrix Aggregation Operators  
*Daowu Pei, Yuying Shan and Huanzhang Liu*

Consistency and Stability in Aggregation Operators with Data Structure  
*Daniel Gomez, Javier Montero, J. Tinguaro Rodriguez and Karina Rojas*

**S-10: Fuzzy Numbers**

room: ETLC E1-017, chair: Luciano Stefanini

Ranking Fuzzy Numbers by Their Left and Right Wingspans  
*Li Zhang-Westman and Zhenyuan Wang*

The Cardinality of the Set of All Fuzzy Numbers  
*Zhenyuan Wang and Li Westman*

Type-2 Fuzzy Numbers and Operations by F-transform  
*Luciano Stefanini and Laerte Sorini*

**S-14: Control: Water Tank**

room: NREF 2-001, chair: Oscar Castillo

Statistical Comparison of Type-1 and Type-2 Fuzzy Systems Design with Genetic Algorithms in the Case of  
Three Tank Water Control  
*Leticia Cervantes and Oscar Castillo*

Comparison of Fuzzy Controllers for the Water Tank Problem with Type-1 and Type-2 Fuzzy Logic  
*Leticia Amador-Angulo, Oscar Castillo and Martha Pulido*

Design of Optimal Membership Functions for Fuzzy Controllers of the Water Tank and  
Inverted Pendulum with PSO Variants  
*Resffa Fierro, Oscar Castillo, Fevrier Valdez and Leticia Cervantes*

**S-13: Weather and Environment**

room: NREF 2-003, chair: Sungshin Kim

Line-shaped Non-precipitation Echo Detection using Fuzzy Inference System  
*Hansoo Lee, Ji Chul Park, Jong Geun Kim and Sungshin Kim*

Unifying Fuzzy controller for Indoor Environment Quality  
*Miguel Molina-Solana, Maria Ros and Miguel Delgado*

Reconstruction of the Environmental Quality Fuzzy Index  
*José Arnaldo F. Roveda, Ana Carolina do Amaral Burghi and Sandra R. M. M. Roveda*

**2:45 pm – 3:45 pm**

---

**FS-36: Fuzzy Logic Applications in Construction Engineering and Management I**

room: ETLC E1-003, chair: Aminah Robinson Fayek

A Preliminary Approach to Classify Work Descriptions in Construction Projects  
*M. Martinez-Rojas, N. Marin and M. A. Vila*

Application of Granular Fuzzy Modeling for Abstracting Labour Productivity Knowledge Bases  
*A. A. Tsehayae W. Pedrycz and A. Robinson Fayek*

Developing a Fuzzy Discrete Event Simulation Framework within a Traditional Simulation Engine  
*N. Sadeghi, A. Robinson Fayek and S. P. Mosayebi*

**FS-34: Hybrid Intelligent Systems I**

room: ETLC E1-017, chair: Patricia Melin

Human Motion Recognition through an Adaptive Fuzzy Estimation of Inertial Sensing  
*Jesus A. Garcia and Leocundo Aguilar*



Internet Service for the Analysis of Enterprise Economics using Time Series Fuzzy Modeling  
*I.G. Perfilieva, N.G. Yarushkina, T.V. Afanasieva, and A.A. Romanov*

Intelligent Hybrid-Learning Mechanism for IT2 TSK NSFLS2 Composed by REFIL-BP Methods  
*Gerardo M. Méndez and M. A. Hernández*

### **FS-30: Fuzzy Pattern Recognition I**

room: NREF 2-001, chair: M.H. Fazel Zarandi

A Multi-Stage Expert System for Classification of Pavement Cracking  
*H. Zakeri, F. Moghadas Nejad, A. Doostparast Torshizi, M. H. Fazel Zarandi, A. Fahimifar*

A new Image Enhancement Method Type-2 Possibilistic C-Mean Approach  
*M.H. Fazel Zarandi, M. Zarinbal*

Possibilistic C-Means Clustering Using Fuzzy Relations  
*M. H. Fazel Zarandi M. Rostam Niakan Kalhori M. F. Jahromi*

### **S-37: Water Quality Analysis**

room: NREF 2-003, chair: Petr Musilek

Enhanced Fuzzy Evidential Reasoning using an Optimization Approach for Water Quality Monitoring  
*Farzad Aminravan, Rehan Sadiq, Mina Hoorfar, Manuel Rodriguez and Homayoun Najjaran*

A Fuzzy Rule-Based Approach for Water Quality Assessment in the Distribution Network  
*Elaheh Aghaarabi, Farzad Aminravan, Rehan Sadiq, Mina Hoorfar, Manuel J. Rodriguez and Homayoun Najjaran*

Fuzzy Index for Public Supply Water Quality  
*Jose A.F. Roveda, Larissa T. Arashiro, Sandra R.M.M. Roveda and Jessica M. Silverio*

**3:45 pm – 4:05 pm**

---

#### **Coffee break**

Location: Solarium

**4:05 pm – 5:25 pm**

---

### **FS-37: Fuzzy Logic Applications in Construction Engineering and Management II**

room: ETLC E1-003, chair: Aminah Robinson Fayek

Fuzzy Consensus Qualitative Risk Analysis Framework for Building Construction Projects  
*A. M. Aboushady, M. M. Marzouk and M. M. G. Elbarkouky*

A Hybrid Fuzzy C-Means Clustering-AHP Framework to Select Construction Contractors  
*M. M. G. Elbarkouky, A. M. El-Deep and M. M. Marzouk*

Fuzzy Dynamic Programming for Optimized Scheduling of Repetitive Construction Projects  
*I. Bakry, O. Moselhi, and T. Zayed*

Quantitative and Qualitative Risk in EPCM Projects Using Fuzzy Set Theory  
*A. Salah and O. Moselhi*

## **FS-35: Hybrid Intelligent Systems II**

room: ETLC E1-017, chair: Patricia Melin

Fuzzy Operators for Quality Evaluation in Images Edge Detection  
*Felicitas Perez-Ornelas, Olivia Mendoza, Patricia Melin and Juan R. Castro*

Fuzzy Logic to Determine Poverty Levels in a Society  
*Alberto Ochoa, Saúl González, Fernando Maldonado and Daniel Azpeitia*

Ant Colony Optimization for Solving the TSP Symmetric with Parallel Processing  
*Fevrier Valdez and Ivan Chaparro*

Fuzzy Logic for Dynamic Adaptation in PSO with Multiple Topologies  
*Juan Carlos Vazquez and Fevrier Valdez*

## **FS-31: Fuzzy Pattern Recognition II**

room: NREF 2-001, chair: M.H. Fazel Zarandi

Difficulties in Choosing a Single Final Classifier from Non-Dominated Solutions in Multiobjective Fuzzy  
Genetics-Based Machine Learning  
*H. Ishibuchi and Y. Nojima*

A Design of FCM-based Interval Type-2 Fuzzy Neural Network Classifier with the Aid of PSO  
*W.-D. Kim, S.-K. Oh K.-S. Seo and W. Pedrycz*

Dual centers Fuzzy Type-2 Clustering  
*M. H. Fazel Zarandi, S. MalekMohamadi Golsefid and S. Bastani*

Fuzzy Type-2 c-ellipses Clustering  
*S. MalekMohamadi Golsefid, M. H. Fazel Zarandi and S. Bastani*

## **FS-28: Complex Fuzzy Sets and Logic**

room: NREF 2-003, chair: Scott Dick

A Conceptual Method for Modeling Residential Utility Consumption Using Complex Fuzzy Sets  
*J. Ma, R. Wickramasuriya, M. Safari, T. Davies and P. Perez*

Why Complex-Valued Fuzzy? Why Complex Values in General? A Computational Explanation  
*O. Kosheleva, V. Kreinovich and T. Ngamsantivong*

Fuzzy in 3-D: Contrasting Complex Fuzzy Sets with Type-2 Fuzzy Sets  
*S. Greenfield and F. Chiclana*

Predicting Solar Power Output using Complex Fuzzy Logic  
*O. Yazdanbaksh, A. Krahn and S. Dick*

**5:45 pm**

---

## **NAFIPS General Meeting**

Location: ETLC E1-003



9:00 am – 9:50 am

---

Keynote presentation

**Foundations of a Fuzzy Logic-based  
Theory of Behavioral Decisions**

Rafik A. Aliev

room: ETLC E1-003, chair: I. Burhan Türkşen

9:50 am – 10:10 am

---

**Coffee break**

Location: Solarium

10:10 am – 11:10 am

---

**S-40: Fuzzy Logic**

room: ETLC E1-003, chair: Antonio Di Nola

Fuzzy Logic as a Geometry

*Peter Lawrence Belluce, Antonio Di Nola and Giacomo Lenzi*

Query Answering over Fact Bases in Fuzzy Propositional Logic

*Gerald S. Plesniewicz*

On Slassic-like Fuzzy Modal Logics

*Adriano Alves Dodó, João Marcos and Flaulles Boone Bergamaschi*

**S-11: Interval-based Modeling and Programming**

room: ETLC E1-017, chair: *Oscar Castillo*

A System Based on Interval Fuzzy Approach to Predict the Appearance of Pests in Agriculture  
*Leonardo Martins Rodrigues, Graçaliz Pereiri Dimuro, Denis Teixeira Franco and José Carlos Fachinello*

A Hybrid Method for IT2 TSK Formation based on the Principle of Justifiable Granularity  
and PSO for Spread Optimization

*Mauricio A. Sanchez, Juan Ramon Castro, Felicitas Perez-Ornelas and Oscar Castillo*

Algorithm for Interval Linear Programming Involving Interval Constraints

*Ibraheem Alolyan*

## **FS-06: Soft Computing in Intelligent Data Processing and Summarization I**

room: NREF 2-001, chair: Sławomir Zadrozny

Bipolar Linguistic Summaries: a Novel Fuzzy Querying Driven Approach  
*M. Dziejczak, J. Kacprzyk and S. Zadrozny*

The Conceptual Framework of Fairness in Consensus Reaching Process Under Fuzziness  
*J. Kacprzyk and D. Gołubińska*

A New Measure of Groups Perturbation  
*M. Krawczak and G. Szkatuła*

## **FS-41: Advances in Granular Computing and Advances in Rough Sets I**

room: NREF 2-003, chairs: JingTao Yao and Yiyu Yao

The K-Modes Method using Possibility and Rough Set Theories  
*Asma Ammar, Zied Elouedi and Pawan Lingras*

Semantic Issues in Game-theoretic Rough Sets  
*Nouman Azam and Jingtao Yao*

Fuzzy Interval Decision-theoretic Rough Sets  
*Dun Liu, Tianrui Li and Decui Liang*

**11:10 am – 12:10 pm**

---

## **S-36: Fuzzy Neural Networks**

room: ETLC E1-003, chair: Patricia Melin

Exchange Rate Prediction Using Fuzzy System Neural Network Approach  
*A. F.M. Khodadad Khan, Mohammed Anwer and Shipra Banik*

A Development of Granular Logic Neural Networks  
*Mingli Song, Yongbin Wang and Shujuan Wang*

Generalized Type-2 Fuzzy Logic in Response Integration of Modular Neural Networks  
*Gabriela E. Martinez, Olivia Mendoza, Juan Ramon Castro, Patricia Melin and Oscar Castillo*

## **S-12: Possibility, Probability and Causality**

room: ETLC E1-017, chair: Thomas Whalen

Uncertainty Quantification for Possibilistic/Probabilistic Simulation  
*Thomas Whalen, Brad Morantz and Murray Cohen*

Simultaneous Assessment of Teams in Collaborative Virtual Environments Using Fuzzy Naive Bayes  
*Ronei Marcos de Moraes and Liliiane S. Machado*

Towards a Better Understanding of Space-Time Causality: Kolmogorov Complexity  
and Causality as a Matter of Degree  
*Vladik Kreinovich and Andres Ortiz*

## **FS-07: Soft Computing in Intelligent Data Processing and Summarization II**

room: NREF 2-001, chair: Slawomir Zadrozny

Coreference Detection in XML Metadata

*M. Szymczak, S. Zadrozny and G. De Tre*

Finite Automata with Imperfect Information as Tools for Accumulating Information

*W. Homenda and W. Pedrycz*

A Harmonization Model with Partial Fuzzy Knowledge

*M. Rybnik and W. Homenda*

## **FS-42: Advances in Granular Computing and Advances in Rough Sets II**

room: NREF 2-003, chairs: JingTao Yao and Yiyu Yao

Mining top-k Granular Association Rules for Recommendation

*Fan Min and William Zhu*

Multi-objective Cost-sensitive Attribute Reduction

*Bingxin Xu, Huiping Chen, William Zhu and Xiaozhong Zhu*

Mean-value-based decision-theoretic shadowed sets

*Xiaofei Deng and Yiyu Yao*

**12:10 pm – 1:15 pm**

---

### **Lunch**

Location: Solarium

**1:15 pm – 2:15 pm**

---

## **FS-05: Information Aggregation in Theory and Practice**

room: ETLC E1-003, chair: Shahnaz N. Shahbazova

Learning Aggregation Weights from 3-tuple Comparison Sets

*Gleb Beliakov, Simon James and Dale Nimmo*

Correlations from Conjugate and Dual Intuitionistic Fuzzy Triangular Norms and Conorms

*Renata Reiser, Lidiane Visintin, Ibero Benitez and Benjamin Bedregal*

An Approach for Aggregation of Experts' Qualitative Evaluations by Means of Fuzzy Sets

*Teimuraz V. Tsabadze*

## **S-32: Management and Supply**

room: ETLC E1-017, chair: Elisabeth Rakus-Andersson

Type 1 Fuzzy Sets in Complex Control Applied to Evaluation of Resort Management System

*Elisabeth Rakus-Andersson and Lujiao Tan*

Application of Fuzzy Classification and Fuzzy Pattern Recognition for Distributed Production  
and Global Supply Chain  
*Dieter Roller and Erik Engesser*

**S-03: Mobile and Autonomous Systems**

room: NREF 2-001, chair: Patricia Melin

Genetic Optimization of Interval Type-2 Fuzzy Reactive Controllers for Mobile Robots  
*Abraham Melendez, Oscar Castillo and Patricia Melin*

Nature Inspired Chemical Optimization to Design a Type-2 Fuzzy Controller for a Mobile Robot  
*Leslie Astudillo, Patricia Melin and Oscar Castillo*

Fuzzy Separation Potential Function Based Flocking Control of Multiple AUVs  
*Basant Kumar Sahu, Madan M. Gupta and Bidyadhar Subudhi*

**S-42: Evolving Techniques in Image, Visual Classification and Controller Design**

room: NREF 2-003, chair: Danilo Dell'Agnello

Image Classification using Evolving Fuzzy Inference Systems  
*Ahmed A. Othman and Hamid R. Tizhoosh*

Fuzzy clustering based encoding for Visual Object Classification  
*Danilo Dell'Agnello, Gustavo Carneiro, Tat-Jun Chin, Giovanna Castellano and Anna Maria Fanelli*

Fuzzy Fractional-Order PID Controller Design using Multi-Objective Optimization  
*Amir Hajiloo and Wen-Fang Xie*

**2:15 pm – 3:35 pm**

---

**S-01: Interval-valued Functions, Series Forecasting, Quantum Channels**

room: ETLC E1-003, chair: Yurilev Chalco-Cano

Study on Interval Fuzzy Series Forecasting based on GM(1,1) Model  
*Xiangyan Zeng and Lan Shu*

A Note on Gronwall Type Inequality for Interval Valued Functions  
*Heriberto Roman-Flores, Yurilev Chalco-Cano and Geraldo N. Silva*

An Ostrowski Type Inequality for Interval-valued Functions  
*Arturo Flores-Franulic, Yurilev Chalco-Cano and Heriberto Roman-Flores*

Characterizing Quantum Channels via Wigner-Yanase Skew Information  
*Zhihua Zhang, Lan Shu, Zhiwen Mo and Jun Zheng*

## **FS-32: Fuzzy Intelligent Agent Systems II**

room: ETLG E1-017, chair: I. Burhan Türkşen

A Supervised Fuzzy Network Analysis for Risk Assessment in Stock Markets: An ANFIS Approach

*M.H. Fazel Zarandi, S.Farivar, I.B. Türkşen*

Developing Type-2 Fuzzy FCA for Similarity Reasoning in the Semantic Web

*H. Safaeipour, M. H. Fazel Zarandi, I. B. Türkşen*

## **S-06: Industrial Applications**

room: NREF 2-001, chair: Gustavo Perez

Biogas Intelligence - operate Biogas Plants using Neural Network and Fuzzy Logic

*Christine Wahmkow, Maximilian Knape and Egon Konnerth*

Fuzzy Defect Based Condition Assessment of Concrete Bridges

*Sami A. Moufti, Tarek Zayed and Saleh Abu Dabous*

Pipeline Risk Assessment Using a Fuzzy Systems Network

*Gustavo Perez*

An Approach to Issue of Diagnosing Marginal Oil Wells

*R.A.Guliyev*

## **S-38: Time Series and Time-Space Analysis**

room: NREF 2-003, chair: Hesam Izakian

Space-time Support System using Simplified Time-Change Fuzzy Set

*Xiang Liu, Shibuya Takeshi and Yasunobu Seiji*

Optimization of Type-2 Fuzzy Integration in Ensemble Neural Networks for  
Predicting the US Dolar/MX Pesos Time Series

*Martha Pulido, Patricia Melin and Oscar Castillo*

Anomaly Detection in Time Series Data using a Fuzzy C-Means Clustering

*Hesam Izakian and Witold Pedrycz*

Parameters to use a fuzzy rulebase approach to remap gridded spatial data

*Jörg Verstraete*





# Important Information

## Registration

The registration desk will be open on the following days:

Sunday, June 23<sup>rd</sup> **3pm – 6pm**

Monday, June 24<sup>th</sup> **8am – 4pm**

from Tuesday, June 25<sup>th</sup> until Thursday, June 27<sup>th</sup> **9pm – 1pm**

## Welcome Reception

Welcome reception will take place on **Monday, June 24<sup>th</sup>** in Solarium (see Floor Plans, page 66) at **5:50pm**.

## Banquet

The Banquet will be held on **Wednesday, June 26<sup>th</sup>** in Fort Edmonton. Buses will be waiting on 116 Street (see Campus Map, page 65) at **6:00pm**. There will be five buses, all available at the same time.

After the banquet, the same buses will leave Fort Edmonton according to the following schedule: one bus at 9:45pm, two buses at 10:00pm, and two buses at 10:15pm.

## NAFIPS General Meeting

General Meeting of the North American Fuzzy Information Processing Society (NAFIPS) will take place on **Thursday, June 27<sup>th</sup> at 5:45pm** in the room **E1-003**. Everyone is welcome. By paying registration fee you automatically become a member of NAFIPS.

## Information for presenters

Please bring your presentation on a memory stick and load it into a computer that is a part of the room's Smart System equipment. You can also use your own laptop that you have to connect to the System. A microphone is also available in each room.

Each presentation is scheduled for 16 mins plus 4 mins for questions. Please upload your presentation prior to your session.

## Internet Access

The area of Engineering Complex – including ETLC and NREF buildings – is covered by University Wireless Service (UWS). **Guest@UofA** allows anyone to connect to the Internet. You can check your mail or browse the web. This service allows for web surfing (http and https) over standard TCP/IP ports 80 and 443.

