

# **2016 Annual Conference of the North American Fuzzy Information Processing Society (NAFIPS 2016)**

**El Paso, Texas, USA  
31 October – 4 November 2016**



**IEEE Catalog Number: CFP16750-POD  
ISBN: 978-1-5090-4493-1**

**Copyright © 2016 by the Institute of Electrical and Electronics Engineers, Inc  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\*This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP16750-POD
ISBN (Print-On-Demand):	978-1-5090-4493-1
ISBN (Online):	978-1-5090-4492-4

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# NAFIPS 2016 - Sessions

## G — General

### G-1

**Acceptable product pricing problem using  $L$ -localized solutions of max-plus interval linear equations**

*Worrawate Leela-apiradee and Phantipa Thipwiwatpotjana*

### G-2

**Extended Kalman Filter Combined with Fuzzy Rules for Localization Using Wireless Transceivers**

*Marbin Pazos-Revilla, Terry Guo, and Motoya Machida*

### G-3

**Heavy moving averages in exchange rate forecasting**

*Ernesto León Castro, Ezequiel Avilés Ochoa, José Maria Merigo Lindahl, Anna Maria Gil Lafuente*

### G-4

**Prioritized induced probabilistic OWA for dispute resolution methods**

*Luis Alessandri Perez Arellano, Ernesto León Castro, Ezequiel Avilés Ochoa, and José Maria Merigo Lindahl*

### G-5

**Relation-Valued Attributes in Rank-Aware Databases and Related Concepts**

*Ondrej Vaverka*

### G-6

**FLUF: Fuzzy Logic Utility Framework to Support Computer Network Defense Decision Making**

*E. Allison Newcomb and Robert Hammell*

### G-7

**Transforming Fuzzy Graphs into Linguistic Variables**

*Marc Osswald, Marcel Wehrle, Edy Portmann, and Alexander Denzler*

### G-8

**A study on the application of regression trees and Adaptive Neuro-Fuzzy Inference System in glass manufacturing process for packaging**

*Herbert R do N Costa and Alessandro La Neve*

### G-9

**A Bibliometric Analysis of Fuzzy Decision Making Research**

*Fabio Blanco-Mesa, José M. Merigó Lindahl, and Anna M. Gil-Lafuente*

### G-10

**Bonferroni distances with OWA operators**

*Fabio Blanco-Mesa and José M. Merigó Lindahl*

### G-11

**The Role of Conceptualization and Operationalization in the Use of Secondary Data**

*M. Kwiatkowska and F. Pouw*

**G-12**

**Caring About Uncertainty**

*Thomas Whalen*

**G-13**

**Properties on Intuitionistic Fuzzy Sets of Third Type**

*R. Srinivasan and Syed Siddiqua Begum*

**G-14**

**Handling Query Answering in Crowdsourcing Systems: A Belief Function-Based Approach**

*Dalila Koulougli, Allel Hadjali, and Idir Rassoul*

**G-15**

**The Image Reduction Process Based on Generalized Mixture Functions**

*Antonio Diego S. Farias, Valdileis S. Costa, Regivan H. N. Santiago, and Benjamin Bedregal*

**G-16**

**A Residuated Function in a Class of Mealy type  $L$ -Valued Finite Automaton**

*Antonio Diego S. Farias, Valdileis S. Costa, Regivan H. N. Santiago, and Benjamin Bedregal*

**G-17**

**Applications and Comparison of Model-Order Reduction Methods based on Wavelets and POD**

*Horacio Flórez and Miguel Argaéz*

**G-18**

**Type-2 fuzzy logic dynamic parameter adaptation in a new fuzzy differential evolution method**

*Patricia Ochoa, Oscar Castillo, and José Soria*

**G-19**

**Performance Evaluation of Evolving Classifier Algorithms in High Dimensional Spaces**

*Ranyeri Rocha and Fernando Gomide*

**G-20**

**Modeling of an Air Conditioning System through techniques of soft-computing**

*Herbert R. do N. Costa and Alessandro La Neve*

**G-21**

**Resource Consumption Prediction Using Neuro-Fuzzy Modeling**

*Roberto Camacho Barranco and Patricia J. Teller*

**G-22**

**A model reduction for highly non-linear problems using wavelets and the Gauss-Newton method**

*Miguel Argaéz, Horacio Flórez, and Osvaldo Méndez*

**G-23**

**Fuzzy Logic for dynamic adaptation in the Imperialist Competitive Algorithm**

*Emer Bernal, Oscar Castillo, and Jose Soria*

#### **G-24**

##### **Constructing a Measure of Information Content for an Ontological Concept**

*Valerie V. Cross*

#### **G-25**

##### **Solving Games**

*Mark J. Wierman*

#### **G-26**

##### **On Takagi Sugeno Approximations of Mamdani Fuzzy Systems**

*Salem B. Bacha and Barnabas Bede*

#### **G-27**

##### **Similarity-based Method for Reduction of Fuzzy Rules**

*Arturo Garcia-Garcia, Marek Z. Reformat, and Andres Mendez-Vazquez*

### **T1 — Special Session: Computing with Words and Beyond**

#### **T1-1**

##### **AI Inferences utilizing Occam Abduction**

*James A. Crowder*

#### **T1-2**

##### **Automatic Discovery of Degrees of Fuzzy Set Membership in Ontologies**

*Christian F. Hempelmann, Max Petrenko, and Gavin Matthews*

#### **T1-3**

##### **Conceptual Defaults in Fuzzy Ontology**

*Julia M. Taylor and Victor Raskin*

#### **T1-4**

##### **From Computing with Words (CW) to Reasoning with Fuzzy Concepts (RFC)**

*Yingxu Wang*

### **T2 — Special Session: Fuzzy Logic Applications in Construction Engineering and Management**

#### **T2-1**

##### **Fuzzy Weighted Average Approach to Ranking Projects in Contractor Initial Bidding**

*Hanouf M. Alhumaidi*

#### **T2-2**

##### **Computational Model for Measuring Project Complexity in Construction**

*Long D. Nguyen, Dai Q. Tran, An T. Nguyen, and Long Le-Hoi*

#### **T2-3**

##### **Overview of Fuzzy Simulation Techniques in Construction Engineering and Management**

*Mohammad Raoufi and Nima Gerami Seresht*

#### T2-4

##### **A Combined Fuzzy Aggregation and Consensus Process for Multi-Criteria Group Decision Making Problems**

*Nasir Bedewi Siraj, Moataz Omar, and Aminah Robinson Fayek*

#### T2-5

##### **Fuzzy Cognitive Map to Model Project Management Problems**

*Denise M. Case and Chrysostomos D. Stylios*

### **T3 — Special Session: Inter-Relation between Interval and Fuzzy Techniques**

#### T3-1

##### **Why $l_p$ -methods in Signal and Image Processing: A Fuzzy-Based Explanations**

*Fernando Cervantes, Bryan Usevitch, and Vladik Kreinovich*

#### T3-2

##### **Join and Meet Operations for Interval-Valued Complex Fuzzy Logic**

*Sarah Greenfield, Francisco Chiclana, and Scott Dick*

#### T3-3

##### **On $\alpha$ -representation of Type-2 Fuzzy sets**

*Juan Carlos Figueroa-Garcia*

#### T3-4

##### **Comparison of Strategies for Solving Global Optimization Problems Using Speculation and Interval Computations**

*Angel F. Garcia Contreras and Martine Ceberio*

#### T3-5

##### **Towards the Most Robust Way of Assigning Numerical Degrees to Ordered Labels, With Possible Applications to Dark Matter and Dark Energy**

*Olga Kosheleva, Vladik Kreinovich, Martha Osegueda Escobar, and Kimberly Kato*

#### T3-6

##### **What If We Use Different “And”-Operations in the Same Expert System**

*Mahdokht Afravi and Vladik Kreinovich*

#### T3-7

##### **Which Point From an Interval Should We Choose?**

*Andrzej Pownuk and Vladik Kreinovich*

#### T3-8

##### **How Resilient Modulus of a Pavement Depends on Moisture Level: Towards a Theoretical Justification of a Practically Important Empirical Formula?**

*Pedro Barragan Olague, Olga Kosheleva, and Vladik Kreinovich*

#### T3-9

##### **Using Interval Constraint Solving Techniques to Better Understand and Predict Future Behaviors of Dynamic Problems**

*Leobardo Valera and Martine Ceberio*

## **T4 — Special Session: Computational Intelligence in Biomedical Applications**

### **T4-1**

#### **Medical Diagnosis from Dental X-Ray Images: A Novel Approach Using Clustering Combined with Fuzzy Rule-based Systems**

*Tran Manh Tuan, Nguyen Hai Minh, Nguyen Van Tao, Tran Thi Ngan, and To Huu Nguyen*

### **T4-2**

#### **A Fuzzy Rule-based Classification System using Hedge Algebraic Type-2 Fuzzy Sets**

*Phan Anh Phong, Tran Dinh Khang, and Dinh Khac Dong*

### **T4-3**

#### **FuzzRESS: A Fuzzy Rule-based Expert System Shell combining Positive and Negative Knowledge for Consultation of Vietnamese Traditional Medicine**

*Nguyen Hoang Phuong*

### **T4-4**

#### **General type-2 fuzzy edge detectors applied to face recognition systems**

*Claudia I. Gonzalez, Juan R. Castro, Olivia Mendoza, Patricia Melin, and Oscar Castillo*

## **T5 — Fuzzy Pattern Recognition with High Uncertainty**

### **T5-1**

#### **Double Coverage Ambulance Location Modeling using Fuzzy Traveling Time**

*B. Lahijanian, M.H. Fazel Zarandi, and F. Vasheghani Farahani*

### **T5-2**

#### **Proposing a Model for Operating Room Scheduling Based on Fuzzy Surgical Duration**

*B. Lahijanian, M.H. Fazel Zarandi, and F. Vasheghani Farahani*

### **T5-3**

#### **Comparison between Choquet and Sugeno Integrals as aggregation operators for pattern recognition**

*Gabriela E. Martinez, Olivia Mendoza, Juan R. Castro, A. Rodriguez-Diaz, Patricia Melin, and Oscar Castillo*

### **T5-4**

#### **A Hybrid Fuzzy Clustering Approach for Fertile and Unfertile Analysis**

*Shima Soltanzadeh, Mohammad Hosein Fazel Zarandi, and Mojtaba Barzegar Astanjin*

### **T5-5**

#### **Generating Ternary Stock Trading Signals Using Fuzzy Genetic Network Programming**

*Hosein Hamisheh Bahar, Mohammad H. Fazel Zarandi, and Akbar Esfahanipour*

## **T6 — High Level Fuzzy Social Networks and Social Media**

### **T6-1**

#### **Evaluating Coordination in Emergency Response Team by using Fuzzy logic through Social Network Analysis**

*Mahbobeh Es-haghi and Susan Bastani*

#### **T6-2**

##### **A Fuzzy Classification Using a Type-2 Fuzzy Model in Social Networks**

*Mansoureh Naderipour, Susan Bastani, Mohammad Fazel Zarandi, and Burhan Turksen*

#### **T6-3**

##### **Crisp to Fuzzy Ontology Conversion in the Context of Social Networks: A New Approach**

*Hoda Safaeipour, M. H. Fazel Zarandi, and Susan Bastani*

#### **T6-4**

##### **A combined facility location and network design model with multi-type of capacitated links and backup facility and non-deterministic demand by fuzzy logic**

*Ali Akbar Sadatasl, Mohammad Hossein Fazel Zarandi, and Abolfazl Sadeghi*

#### **T6-5**

##### **Calibrating a Video Game Using Fuzzy Logic**

*Samir Abou-Samra*