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4:30PM **F-16181** **Synchronous Tracking Control of Gantry Stage Using Adaptive Fuzzy Moving Sliding Mode Approach.....N/A**
Yu-Chen Lin[1], Tsung-Chih Lin[2], Yi-Chao Chen[1] and Tai-Yi Liu[2]
[1]Department of Automatic Control Engineering, Feng Chia University, Taichung, 40724, Taiwan, R.O.C; [2]Department of Electronic Engineering, Feng Chia University, Taichung, 40724, Taiwan. R.O.C.

4:50PM **F-16076** **Adaptive Fuzzy Sliding Mode Active Vibration Control for Rail Vehicle Pantograph.....N/A**
Tsung-Chih Lin[1], Jian-Lin Yeh[1], Chia-Hao Kuo[2], Yu-Chen Lin[3] and Valentina E. Balas[4]
[1]Department of Electronic Engineering, Feng-Chia University, Taichung, Taiwan; [2]Ph.D. Program of Electrical and Communications Engineering, Feng-Chia University, Taichung, Taiwan; [3]Department of Automatic Control Engineering Feng Chia University Taichung 40724, Taiwan; [4]Department of Automation and Applied Informatics Aurel Vlaicu University of Arad Arad, Romania

5:10PM **F-16371** **Direct Adaptive Fuzzy Control for a Class of Nonlinear Systems With Unknown Control Gain Sign.....N/A**
Salim Labiod[1] and Thierry Marie Guerra[2]
[1]LAJ, Faculty of Science and Technology, University of Jijel, Jijel, Algeria; [2]LAMIH, UMR CNRS 8201, Université de Valenciennes, et du Hainaut-Cambrésis, Le Mont Houy, 59313, Valenciennes Cedex 9, France.

Session MP-10	SS FUZZ-IEEE-06B: Software for Soft Computing / SS FUZZ-IEEE-30: Fuzzy Approaches for Advanced Manufacturing
Date/Time	Monday, 25 July 2016 / 4:30PM – 6:30PM
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Chair	Jesús Alcalá-Fdez / Luka Eciolaza

4:30PM **F-16515** **jMeme: a Java Library for Designing Competent Memetic Algorithms.....386**
Giovanni Acampora[1] and Autilia Vitiello[2]
[1]School of Science and Technology, Nottingham Trent University, Nottingham, United Kingdom NG11 8NS; [2]Department of Computer Science, University of Salerno, Fisciano, Salerno, 84084, Italy .

4:50PM **F-16578** **Electrode Degradation Analysis in Aluminium-based Resistance Spot Welding Process.....394**
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IK4 LORTEK, Ordizia, Gipuzkoa, Spain.

5:10PM **F-16304** **Model-Based Feature Selection Based on Radial Basis Functions and Information Measures.....401**
Georgios N. Tzagarakis and George Panoutsos
Department of Automatic Control and Systems Engineering, University of Sheffield, Sheffield, UK.

5:30PM **F-16298** **A Fuzzy Logic Based System for Mixed Reality Assistance of Remote Workforce.....408**
Anasol Peña-Rios[1], Hani Hagras[1], Michael Gardner[1] and Gilbert Owusu[2]
[1]Intelligent Environments Research Group, School of Computer Science and Electronic Engineering, University of Essex, Wivenhoe Park, Colchester, UK; [2]Business Modelling and Operational Transformation Practice, British Telecom, Adastral Park, Martlesham Heath, Ipswich, UK

5:50PM **F-16358** **Battery Diagnosis for Electrical Vehicles Through Semi-Physical Fuzzy Models.....416**
Luciano Sánchez[1], José Otero[1], Inés Couso[2] and Cecilio Blanco[3]
[1]Universidad de Oviedo, Computer Science Department, Asturias, Spain; [2]Universidad de Oviedo, Statistics Department, Asturias, Spain; [3]Universidad de Oviedo, Electronics Department, Asturias, Spain.

Session MP-11	Fuzzy Measures and Applications
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Chair	Guy De Tre

4:30PM **F-16177** **Partial Absorption Aggregators with Fuzzy Integrals.....424**
Robin De Mol, Antoon Bronselaer and Guy De Tré
Department of Telecommunications and Information Processing, Ghent University, Belgium.

4:50PM **F-16046** **Expressive Power of Linear-Temporal Logic Based on Generalized Possibility Measures.....431**
Shengli Zhang[1,2] and Yongming Li[1]
[1]School of of Computer Science, Shaanxi Normal University, Xi'an, 710119, Shaanxi, China; [2]School of Information Technology, Xingyi Normal University for Nationalities, Xingyi, 562400, Guizhou, China

5:10PM **F-26047** **Experimental Study of Different Aggregation Functions for Modeling Craniofacial Correspondence in Craniofacial Superimposition.....437**
Carmen Campomanes-Alvarez, Oscar Ibáñez and Oscar Cordón
Department of Computer Sciencem and Artificial Intelligencem University of Granada, Granada, Spain.

5:30PM **F-16157** **Finding Temporal Associative Patterns of Web Search with Stock Price Movements for Trading Strategy Design.....445**
Qiang Wei, Xian Zhao, Changyu Wang and Guoqing Chen
Research Center for Contemporary Management, Key Research Institute of Humanities and Social Sciences at Universities, School of Economics and Management, Tsinghua University, Beijing, 100084, China.

Session MP-18	Recent Advances in CI: Best Student Paper Competition
Date/Time	Monday, 25 July 2016 / 4:30PM – 6:30PM
Venue	Room 208+209
Chair	Yew Soon Ong

4:30PM **E-17092** **Evolvability as a Quality Criterion for Linear Deformation Representations in Evolutionary Optimization.....N/A**
Andreas Richter[1], Jascha Achenbach[1], Stefan Menzel[2] and Mario Botsch[1]
[1]Computer Graphics Group, Bielefeld University, Germany; [2]Honda Research Institute Europe, Germany

4:50PM	**E-16367**	**Social-Insect-Inspired Adaptive Task Allocation for Many-Core Systems.....N/A** Matthew Rowlings, Andy M. Tyrrell and Martin A. Trefzer *Intelligent Systems Group, Department of Electronics, University of York, York, YO31 5DD, UK.*
5:10PM	**F-16137**	**Measuring the Similarity between zSlices General Type-2 Fuzzy Sets with Non-Normal Secondary Membership Functions.....461** Josie McCulloch and Christian Wagner *Lab for Uncertainty in Data and Decision Making (LUCID) and Horizon, School of Computer Science, University of Nottingham, Nottingham, NG8 1BB, UK.*
5:30PM	**F-16508**	**An Analytical Approach for Solving Type-1 and Type-2 Fully Fuzzy Linear Systems of Equations.....453** Sheriff Sadiqbatcha and Saeed Jafarzadeh *Computer & Electrical Engineering, California State University of Bakersfield, Bakersfield, CA, USA.*
5:50PM	**N-16573**	**Spin Torque Nano-Oscillator based Oscillatory Neural Network.....N/A** Chamika M. Liyanagedera[1], Karthik Yogendra[1], Kaushik Roy[1] and Deliang Fan[2] *[1]School of Electrical & Computer Engineering, Purdue University; [2]School of Electrical and Computer Engineering, University of Central Florida, USA.*
6:10PM	**N-16558**	**Detection of False Data Attacks in Smart Grid with Supervised Learning.....N/A** Jun Yan, Bo Tang and Haibo He *[1]Department of Electrical, Computer, and Biomedical Engineering, University of Rhode Island, Kingston, Rhode Island 02881, USA.*

Session TA-8	Fuzzy Control
Date/Time	Tuesday, 26 July 2016 / 8:00AM – 10:00AM
Venue	Room 220
Chair	Thomas Runkler

8:00AM	**F-16057**	**Robust Observer-Based Fuzzy Incremental Sliding-Mode Control of Underactuated Systems.....469** Chiang-Cheng Chiang and Yu-Sheng Yang *Department of Electrical Engineering, Tatung University, Taipei, Taiwan, R.O.C.*
8:20AM	**F-16059**	**Model Reference Fuzzy Sliding Mode Control of Strict-Feedback Uncertain Systems with Unknown Dead-Zone.....477** Chiang-Cheng Chiang and Chuan-Tien Tsai *Department of Electrical Engineering, Tatung University, Taipei, Taiwan, R.O.C.*
8:40AM	**F-16141**	**A Fuzzy Logic Based Super-twisting Sliding Mode Control Scheme for Electronic Throttle Control.....485** Mohammad Fazle Azeem[1] and Abdul Kareem[2] *[1]Department of Electrical Engineering, Aligarh Muslim University, Aligarh, India; [2]Department of Electronics & Communication Engineering, Mangalore Institute of Technology & Engineering, Moodabidri, Mangalore, India.*

9:00AM	**F-16095**	**Decentralized Fault Tolerant Control of Uncertain Nonlinear Large-Scale Systems with Dead-Zone Input.....493** Chiang-Cheng Chiang and Chia-Hang Lu *Department of Electrical Engineering, Tatung University, Taipei, Taiwan, R.O.C.*
9:20AM	**F-16146**	**Experimental Results of Slip Control with a Fuzzy–Logic–Assisted Unscented Kalman Filter for State Estimation.....501** Pavel Osinenko[1], Mike Geißler[2], Thomas Herlitzius[2] and Stefan Streif[1] *[1]Technische Universität Chemnitz, Institute of Automation, Laboratory for Automatic Control and System Dynamics, 09107 Chemnitz, Germany; [2]Technische Universität Dresden, Institute of Processing Machines and Mobile Machinery, 01069 Dresden, Germany.*
9:40AM	**F-16449**	**Game Theoretic Fuzzy Multi-Entity Bayesian Networks for Collision Avoidance in VANETs.....508** Keyvan Golestan, Ridha Soua, Fakhri Karray and Mohamed S. Kamel *Centre for Pattern Analysis and Machine Intelligence (CPAMI), Department of Electrical and Computer Engineering, University of Waterloo, Waterloo, Ontario, Canada.*

Session TA-9	SS FUZZ-IEEE-19: Interval-Valued Fuzzy Sets: Theory and Applications / SS FUZZ-IEEE-26: From Type-1 to Type-n Fuzzy Systems Modeling
Date/Time	Tuesday, 26 July 2016 / 8:00AM – 10:00AM
Venue	Room 221
Chair	Humberto Bustince / Mohammad H. Fazel Zarandi

8:00AM	**F-16360**	**A Bilateral Schema for Interval-Valued Image Differentiation.....516** C. Lopez-Molina[1], C. Marco-Detchart[1], L. De Miguel[1], H. Bustince[1], J. Fernandez[1] and B. De Baets[2] *[1]Dpto. Automatica y Computacion, Universidad Publica de Navarra, Pamplona, Spain; [2]Kermit, Department of Math. Model., Statistics and Bioinformatics, Ghent University, Ghent, Belgium.*
8:20AM	**F-16314**	**Fuzzy, I-Fuzzy, and H-Fuzzy Partitions to Describe Clusters.....524** Vicenç Torra[1], Laya Aliahmadipour[2] and Anders Dahlbom[1] *[1]School of Informatics University of SkövdeSkövde, Sweden; [2]Department of Computer Science Shahid Bahonar University of Kerman, Iran*
8:40AM	**F-16079**	**Interval-Valued Fuzzy Cognitive Maps for Supporting Business Decisions.....531** Petr Hajek and Ondrej Prochazka *Faculty of Economics and Administration, University of Pardubice, Pardubice, Czech Republic.*
9:00AM	**F-16213**	**A Generalized Type-2 Fuzzy Logic System for the Dynamic Adaptation the Parameters in a Bee Colony Optimization Algorithm Applied in an Autonomous Mobile Robot Control.....537** Leticia Amador — Angulo[1], Oscar Castillo[1] and Juan R. Castro[2] *[1]Division of Graduate Studies, Tijuana Institute of Technology, Tijuana, México; [2]Faculty of Chemical Sciences and Engineering, Autonomous University of Baja California, Tijuana, México.*

9:20AM **F-16439** **Quasi Type-2 Fuzzy Markov Chains: An Approach.....545**
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Universidad Distrital Francisco José de Caldas, Bogotá — Colombia

9:40AM **F-16452** **Visual Analysis and Representations of Type-2 Fuzzy Membership Functions.....550**
Desh Raj[1,3], Kenil Tanna[1,3], Bhuvnesh Garg[2,3] and Frank Chung-Hoon Rhee[3]
[1]Department of Computer Science and Engineering, Indian Institute of Technology Guwahati, Guwahati, 781039, India; [2]Department of Mathematics, Indian Institute of Technology Guwahati, Guwahati, 781039, India; [3]Department of Electronics and Communication Engineering, Hanyang University, Ansan-Si, 15588, Korea.

Session TA-10	SS FUZZ-IEEE-17: Linguistic Summarization and Description of Data
Date/Time	Tuesday, 26 July 2016 / 8:00AM – 10:00AM
Venue	Room 222
Chair	Anna Wilbik

8:00AM **F-16264** **On the Generation of useful Linguistic Summaries of Sequences.....555**
Anna Wilbik and Remco M. Dijkman
Information Systems, School of Industrial Engineering, Eindhoven University of Technology, Eindhoven, The Netherlands.

8:20AM **F-16307** **Using Specificity to Measure Referential Success in Referring Expressions with Fuzzy Properties.....563**
Nicolás Marín, Gustavo Rivas-Gervilla and Daniel Sánchez
Department of Computer Science and Artificial Intelligence, University of Granada, 18071, Granada, Spain.

8:40AM **F-16091** **Combining Fuzzy Experts' Decisions Fusion with Linguistic Summarization of Mammograms for Computer-Aided Breast Diagnosis.....571**
Éldman de O. Nunes[1], Ángel Sánchez[2], Belén Moreno[2] and Aura Conci[3]
[1]P.P.G. em Sistemas e Computação, Universidade Salvador, UNIFACS, Salvador-BA, Brazil; [2]E.T.S. Ingeniería Informática, Universidad Rey Juan Carlos, Móstoles (Madrid), Spain; [3]Instituto de Computação, Universidade Federal Fluminense, Niterói-RJ, Brazil.

9:00AM **F-16150** **How to Talk to Strangers: Generating Medical Reports for First-Time Users.....579**
Dimitra Gkatzia[1], Verena Rieser[2] and Oliver Lemon[2]
[1]Institute of Informatics and Digital Innovation, School of Computing, Edinburgh Napier University, Edinburgh, EH10 5DT, UK; [2]Interaction Lab, School of Mathematical and Computer Sciences, Heriot-Watt University, Edinburgh, EH14 4AS, UK.

9:20AM	**F-16243**	**Natural Language Generation and Fuzzy Sets: An Exploratory Study on Geographical Referring Expression Generation.....587** Alejandro Ramos-Soto[1], Nava Tintarev[2], Rodrigo de Oliveira[3], Ehud Reiter[3] and Kees van Deemter[3] *[1]Centro Singular de Investigación en Tecnoloxías da Información (CiTIUS), Universidade de Santiago de Compostela; [2]Department of Computing and Informatics, University of Bournemouth; [3]Department of Computing Science, University of Aberdeen, UK.*
9:40AM	**F-16540**	**Linguistic Summarization Using a Weighted N-gram Language Model Based on the Similarity of Time-series Data.....595** Kasumi Aoki[1] and Ichiro Kobayashi[2] *[1]Department of Information Sciences, Faculty of Sciences, Ochanomizu University, Tokyo, Japan; [2]Advanced Sciences, Graduate School of Humanities and Sciences, Ochanomizu University, Tokyo, Japan.*

Session TA-11	Type-2 Fuzzy Systems and Applications
Date/Time	Tuesday, 26 July 2016 / 8:00AM – 10:00AM
Venue	Room 223
Chair	Jerry Mendel

8:00AM	**F-16138**	**An Extended ANFIS Architecture and its Learning Properties for Type-1 and Interval Type-2 Models.....602** Chao Chen, Robert John, Jamie Twycross and Jonathan M. Garibaldi *School of Computer Science, University of Nottingham.*
8:20AM	**F-16297**	**Metaheuristic Tuning of Type-II Fuzzy Inference Systems for Data Mining.....610** Varun Kumar Ojha[1], Ajith Abraham[2] and Václav Snášel[1] *[1]IT4Innovations, VŠB Technical University of Ostrava, Ostrava, Czech Republic; [2]Machine Intelligence Research Lab, Auburn, WA, USA.*
8:40AM	**F-16332**	**Game of Drones: UAV Pursuit-Evasion Game with Type-2 Fuzzy Logic Controllers Tuned by Reinforcement Learning.....618** Efe Camci and Erdal Kayacan *Nanyang Technological University, School of Mechanical and Aerospace Engineering, 639798, Singapore.*
9:00AM	**F-16462**	**Analysis Using Analytical Structure on the Fitting Ability of Interval Type-2 Fuzzy Model with Non-symmetrical Fuzzy Sets.....626** Chun Ming Tommy Yip and Woei Wan Tan *Department of Electrical and Computer Engineering, National University of Singapore, 117576, Singapore.*
9:20AM	**F-16546**	**A Novel Gesture Recognition System Based on Fuzzy Logic for Healthcare Applications.....634** Sriparna Saha[1], Shreyasi Datta[1], Amit Konar[1], Bonny Banerjee[2] and Atulya K. Nagar[3] *[1]Electronics & Tele-Communication Engineering Department, Jadavpur University, Kolkata, India; [2]Electrical & Computer Engineering Department, The University of Memphis, United States of America; [3]Mathematics and Computer Science Department, Liverpool Hope University, United Kingdom.*

Session	[Plenary] – Ground Truth Bias in External Cluster Validity Indices, Prof. James C. Bezdek
Date/Time	Tuesday, 26 July 2016 / 1:00PM – 2:00PM
Venue	Room Ballroom B
Chair	James M. Keller

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Date/Time	Tuesday, 26 July 2016 / 2:00PM – 6:00PM
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P101 **F-16006** **A Big-Bang Big-Crunch Fuzzy Logic Based System for Sports Video Scene Classification.....642**
Wei Song and Hani Hagras
The Computational Intelligence Centre, School of Computer Science and Electronic Engineering, University of Essex Colchester, UK.

P102 **F-16026** **A Simplified Implementation of Interval Type-2 Fuzzy System and its Application in Students' Academic Evaluation.....650**
Ibrahim A. Hameed
Department of Automation Engineering, Faculty of Engineering and Natural Sciences, Norwegian University of Science and Technology (NTNU) in Ålesund, Larsgårdsvegen 2, 6009 Ålesund, Norway.

P103 **F-16027** **Membership Functions Representing a Number vs. Representing a Set: Proof of Unique Reconstruction.....657**
Hung T. Nguyen[1], Vladik Kreinovich[2] and Olga Kosheleva[2]
[1]Department of Mathematical Sciences, New Mexico State University, Las Cruces, New Mexico 88008, USA and Faculty of Economics Chiang Mai University, Thailand; [2]University of Texas at El Paso, El Paso, Texas 79968, USA.

P104 **F-16074** **Rough Set-Based Concept Mining from Social Networks.....663**
Tuan-Fang Fan[1] and Churn-Jung Liau[2]
[1]Department of Computer Science and Information Engineering, National Penghu University of Science and Technology, Penghu 880, Taiwan; [2]Institute of Information Science, Academia Sinica, Taipei 115, Taiwan.

P105 **F-16075** **A Fuzzy Association Rule Mining Framework for Variables Selection Concerning the Storage Time of Packaged Food.....671**
Yasmin Y. Y. Hui, K. L. Choy, G. T. S. Ho and H. Y. Lam
Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University, Hong Kong

P106	**F-16080**	**Fuzzy Control of Intelligent Indoor Exercise Environment in Air-Polluted Area.....678** Shaodan Zhi, Yongbin Wei, Jun Wang and Wei Zhao *Technical Center, China State Construction Engineering Corporation Limited No. 15 of Linhe Street, Shunyi District, Beijing 101300, People's Republic of China.*
P107	**F-16081**	**Classification of Melodic Structures Using Fuzzified n-Gram Matching Scores.....685** Chandanpreet Kaur and Ravi Kumar *Department of Electronics and Communication Engineering, Thapar University, Patiala, India.*
P108	**F-16097**	**T-S Fuzzy Control Based on Riccati Differential Equation.....691** Wen Yu[1], Jorge Cervantes[1] and Sergio Salazar[2] *[1]Departamento de Control Automatico, CINVESTAV-IPN (National Polytechnic Institute), Mexico City, Mexico; [2]UMI-LAFMIA 3175 CNRS, CINVESTAV-IPN (National Polytechnic Institute), Mexico City, Mexico*
P109	**F-16104**	**Estimation of Optimal Cluster Number for Fuzzy Clustering with Combined Fuzzy Entropy Index.....697** Hong He[1], Yonghong Tan[1] and Ken'ichi Fujimoto[2] *[1]College of Information, Mechanical and Electrical Engineering, Shanghai Normal University, Shanghai 200234, China; [2]University Consortium for e-Learning, Shikoku Center, Kagawa University, Kagawa 760-8521, Japan*
P110	**F-16117**	**Bonferroni Mean Based Similarity based TOPSIS.....704** Pasi Luukka and Mikael Collan *School of Business, Lappeenranta University of Technology, P.O. Box 20, FIN-53851 Lappeenranta, Finland.*
P111	**F-16148**	**A Fuzzy-Wavelet Neural Network Model for the Detection of Meat Spoilage Using an Electronic Nose.....710** Vassilis S. Kodogiannis and Abeer Alshejari *Faculty of Science and Technology, University of Westminster, London, United Kingdom.*
P112	**F-16287**	**A Fuzzy Co-clustering Interpretation of Probabilistic Latent Semantic Analysis.....718** Katsuhiro Honda, Takafumi Goshima, Seiki Ubukata and Akira Notsu *Graduate School of Engineering, Osaka Prefecture University, Sakai, Osaka 599-8531, Japan.*
P113	**F-16337**	**A Stabilizing Model Fuzzy Predictive Control Scheme for Nonlinear Deterministic Systems.....724** Teniou Samir and Khaled Belarbi *Department of Electrical Engineering, National Polytechnic School of Constantine, Constantine, Algeria.*
P114	**F-16355**	**Fuzzy-CA Model for an In-silico Cancer Cell Line: A Journey from Simple Cellular Pattern to an Emergent Complex Behavior.....730** Nasibeh Rady Raz and Mohammad-R. Akbarzadeh-T *Department of Computer and Electrical Engineering, Center of Excellence on Soft Computing and Intelligent Information processing, Ferdowsi University of Mashhad, Mashhad, Iran.*

P115 **F-16368** **A Fuzzy Clustering Based Method For the Spatiotemporal Analysis of Criminal Patterns.....738**
Diego Mayorga[1], Miguel A. Melgarejo[2] and Nelson Obregon[3]
[1]Universidad Distrital FJC, Bogota DC, Colombia; [2]Universidad Distrital FJC, Pontifical Xaverian University, Bogota DC, Colombia; [3]Pontifical Xaverian University, National University of Colombia, Bogota DC, Colombia.

P116 **F-16376** **A Fuzzy Binomial Naive Bayes Classifier for Epidemiological Data.....745**
Ronei M. Moraes[1] and Liliane S. Machado[2]
[1]Department of Statistics, Federal University of Paraiba, Brazil, Paraiba, Joao Pessoa 58051 – 900, Brazil; [2]Department of Informatics, Federal University of Paraiba, Brazil, Paraiba, Joao Pessoa 58058–600, Brazil.

P117 **F-16405** **A Fully tuned Sequential Interval Type-2 Fuzzy Inference System for Motor-imagery Task Classification.....751**
A. K. Das, S. Suresh and N. Sundararajan
School of Computer Engineering, Nanyang Technological University, 639798, Singapore.

P118 **F-16411** **Fuzzy Reasoning Based Windows Firewall for Preventing Denial of Service Attack.....759**
Nitin Naik and Paul Jenkins
Defence School of Communications and Information Systems, Ministry of Defence, UK.

P119 **F-16413** **Evolutionary Dual Rule-based Fuzzy Path Planner for Omnidirectional Mobile Robot.....767**
Chansol Hong, Chan Woo Park and Jong-Hwan Kim
School of Electrical Engineering, KAIST, Daejeon, 3414, Republic of Korea.

P120 **F-16434** **On fuzzy α-lattices.....775**
Ivan Mezzomo[1] and Benjamin C. Bedregal[2]
[1]Department of Mathematical Sciences, Technology and Humanities — DCETH, Rural Federal University of Semi-Arid — UFERSA, Angicos, Rio Grande do Norte, Brazil; [2]Department of Informatics and Applied Mathematics — DIMAp, Federal University of Rio Grande do Norte — UFRN, Natal, Rio Grande do Norte, Brazil.

P121 **F-16511** **Towards a New Convolution-based Approach to the Specification of STPU-solutions.....782**
Krystian Adam Jobczyk and Antoni Ligęza
AGH University of Science and Technology, Department of Applied Computer Science, al. Mickiewicza 30, 30-059 Krakow.

P122 **F-16517** **Flexible Document Organization by Mixing Fuzzy and Possibilistic Clustering algorithms.....790**
Nilton V. Carvalho Jr.[1], Solange O. Rezende[2], Heloisa A. Camargo[3] and Tatiane M. Nogueira[1]
[1]Department of Computer Science, Federal University of Bahia, Brazil; [3]Institute of Mathematics and Computer Science, University of São Paulo — Brazil; [3]Department of Computer Science, Federal University of São Carlos — Brazil.

P123	**F-16520**	**Probabilistic Coverage of Linguistic IF-THEN Rules.....798** Pavel Rusnok *Institute for Research and Applications of Fuzzy Modeling, Centre of Excellence IT4Innovations, University of Ostrava 30. dubna 22, Ostrava 701 03, Czech Republic.*
P124	**F-16535**	**A Hardware Architecture for Real-Time Edge Detection Based on Interval Type-2 Fuzzy Logic.....804** E. Ontiveros- Robles[1], J. L. Gonzalez-Vazquez[1], J. R. Castro[1] and O. Castillo[2] *[1]School of Engineering, University of Baja California, Tijuana, México; [2]Division of Graduate Studies, Tijuana Institute of Technology, Tijuana, México.*
P125	**F-16549**	**Chassis Control Based on Fuzzy Logic.....811** Carlos Alberto Vivas-Lopez[1], Ruben Morales-Menendez[1], Ricardo Ramirez-Mendoza[1], Olivier Sename[2] and Luc Dugard[2] *[1]Tecnológico de Monterrey, School of Engineering and Sciences, 64, 849 Monterrey, Nuevo León, México; [2]GIPSA-lab / Control System Department, Grenoble Institute of Technology, 38, 402 Saint Martin d'Heres Cedex, France.*
P126	**F-16566**	**ANFIS to Estimate Damping Coefficient from EMG to Optimize the Interaction Force.....818** Tanvir Anwar and Adel Al Jumaily *University of Technology, Sydney, Australia.*
P127	**F-16592**	**On Interval-Valued Possibilistic Clustering with a Generalized Objective Function.....824** József Mezei[1,2] and Peter Sarlin[2,3] *[1]IAMSR, Åbo Akademi University, Turku, Finland; [2]Department of Economics, Hanken School of Economics, Helsinki, Finland; [3]Risklab Finland at Arcada University of Applied Sciences, Helsinki, Finland*
P128	**F-16571**	**Obstacle avoidance for mobile robots: A Hybrid Intelligent System Based on Fuzzy Logic and Artificial Neural Network.....1038** Raulcézar M. F. Alves and Carlos R. Lopes *Faculty of Computing, Federal University of Uberlândia, UFU, Uberlândia, Brazil.*

ession TM-8	Fuzzy Control Applications
Date/Time	Tuesday, 26 July 2016 / 2:30PM – 4:30PM
Venue	Room 220
Chair	Michaela Killian

2:30PM	**F-16214**	**Cooperative Fuzzy Model Predictive Control for a Multivariate Process.....831** Michaela Killian and Martin Kozek *Vienna University of Technology, Institute of Mechanics and Mechatronics, 1060 Vienna, Austria.*

2:50PM **F-16106** **The Objective Measurement Method of Minimum Resolvable Temperature Difference for Infrared Imaging System Based on ANFIS.....837**
Xuan Xiao[1], Feng Pan[1], Weixing Li[1], Qi Gao[1] and Dengliang Xiong[2]
[1]School of Automation, Beijing Institute of Technology, Beijing, China; [2]Yunnan Basic Surveying and Mapping Technology Center, Kunming, China

3:10PM **F-16189** **System Identification and Damping Coefficient Estimation from EMG Based on ANFIS to Optimize Human Exoskeleton Interaction.....844**
Tanvir Anwar and Adel Al Jumaily
University of Technology, Sydney, Australia.

3:30PM **F-16330** **A New Neural-Dynamic Control Method of Position and Angular Stabilization for Autonomous Quadrotor UAVs.....850**
Zhijun Zhang[1], Jianli Yu[1], Yuanqing Li[1] and Xiaoyan Zhang[2]
[1]School of Automation Science and Engineering. South China University of Technology Guangzhou, Guangdong 510640; [2]School of Computer Science and Software Engineering, Shenzhen University, Shenzhen, Guangdong, 518060, China

3:50PM **F-16599** **Fuzzy Logic Controllers for Navigation and Control of AR.Drone Using Microsoft Kinect.....856**
Prahlad Vadakkepat[1], Tze Chiang Chong[2], Willson Amalraj Arokiasami[1] and Xu Weinan[1]
[1]Department of Electrical and Computer Engineering, National University of Singapore, Singapore; [2]Land Transport Authority, Singapore

Session TM-9	SS FUZZ-IEEE-33A: Information Fusion and Fuzzy Linguistic Decision Making
Date/Time	Tuesday, 26 July 2016 / 2:30PM – 4:30PM
Venue	Room 221
Chair	Francisco Herrera - Luis Martnez

2:30PM **F-16090** **An Optimization-Based Approach to Estimate the Range of Consistency in Hesitant Fuzzy Linguistic Preference Relations.....864**
Cong-Cong Li[1], Yucheng Dong[1], Francisco Herrera[2] and Luis Martínez[3]
[1]Business School, Sichuan University, Chengdu 610065, China; [2]Department of Computer Science and Artificial Intelligence, University of Granada, Granada 18071, Spain, and also with the Faculty of Computing and Information Technology, King Abdulaziz University, North Jeddah. 21589, Saudi Arabia; [3]Department of Computer Science, University of Jaén, Jaén 23071, Spain.

2:50PM **F-16161** **Fusing Multi-Granular Unbalanced Hesitant Fuzzy Linguistic Information in Group Decision Making.....872**
Wen-Yu Yu[1], Qiu-Yan Zhong[1] and Zhen Zhang[2]
[1]Institute of Information Management & Information Systems, Dalian University of Technology, Dalian, China; [2]Institute of Systems Engineering, Dalian University of Technology, Dalian, China.

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Zhibin Wu and Lin Zhong
Business School, Sichuan University, Chengdu, China.

3:30PM	**F-16270**	**A Fuzzy System for Estimating Premium Cost of Option Exchange Using Mamdani Inference: Derivates Market of Mexico.....888** M. Muñoz[1] and E. Miranda[2] *[1]Accounting Deparment, University of Sonora, Hermosillo, México; [2]University of Occident, Culiacan, Mexico.*
3:50PM	**F-16384**	**Mixed Intuitionistic Fuzzy Aggregation Operators Decreasing Results of Unusual IFNs.....896** Hengshan Zhang, Qinghua Zheng, Ting Liu and Yu Qu *The Ministry of Education Key Lab for Intelligent Networks and Network Security, Department of Computer Science and Technology, Xian Jiaotong University, Xian, China.*
4:10PM	**F-16524**	**A Resolution Method for Linguistic Truth-Valued Intuitionistic Fuzzy First-Order Logic.....904** Lin Xiao[1], Jia Meng[1], Shifei Ding[2] and Li Zou[1] *[1]School of Computer and Information Technology, Liaoning Normal University, Dalian China; [2]School of Computer Science and Technology, China University of Mining and Technology, Xuzhou China*

Session TM-10	SS FUZZ-IEEE-28: Fuzzy-based Methods for Machine Learning: Data Preprocessing, Learning Models and Their Applications
Date/Time	Tuesday, 26 July 2016 / 2:30PM – 4:30PM
Venue	Room 222
Chair	Mikel Galar

2:30PM	**F-16187**	**Optimization of Chi-FRBCS-BigDataCS Fuzzy Rule-Based Classification System.....907** Mikel Elkano, Mikel Galar, Jose Sanz and Humberto Bustince *Department of Automatics and Computation, Public University of Navarre, Campus Arrosadía s/n, 31006, Pamplona, Spain.*
2:50PM	**F-16131**	**Tackling Label Noise with Multi-Class Decomposition Using Fuzzy One-Class Support Vector Machines.....915** Bartosz Krawczyk[1], José A. Sáez[2] and Michał Woźniak[1] *[1]Department of Systems and Computer Networks, Wrocław University of Technology, Wrocław, Poland; [2]ENGINE Centre, Wrocław University of Technology, Wrocław, Poland.*
3:10PM	**F-26048**	**A Network-based Approach for Diversity Visualization of Fuzzy Classifier Ensembles.....923** Krzysztof Trawiński[1] and Oscar Cordón[2] *[1]Novelti, 28012 Madrid, Spain; [2]Department of Computer Science and Artificial Intelligence (DECSAI) and the Research Center on Information and Communication Technologies (CITIC-UGR), University of Granada, 18071 Granada, Spain.*

3:30PM **F-16087** **Fuzzy Rough Sets for Self-Labelling: an Exploratory Analysis.....931**
Sarah Vluymans[1,2,3], Neil Mac Parthaláin[4], Chris Cornelis[1,3] and Yvan Saeys[2,5]
[1]Department of Applied Mathematics, Computer Science and Statistics, Ghent University, Ghent, Belgium; [2]VIB Inflammation Research Center, Zwijnaarde, Belgium; [3]Department of Computer Science and Artificial Intelligence, University of Granada, Granada, Spain; [4]Department of Computer Science, Aberystwyth University, Aberystwyth, Ceredigion, Wales, UK; [5]Department of Respiratory Medicine, Ghent University, Ghent, Belgium.

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Bas van Stein, Hao Wang, Wojtek Kowalczyk, Michael Emmerich and Thomas Bäck
Leiden Institute of Advanced Computer Science, Leiden University, Niels Bohrweg 1, Leiden, The Netherlands.

4:10PM **F-16420** **Fuzzy-Citation-KNN: A Fuzzy Nearest Neighbor Approach for Multi-Instance Classification.....946**
Pedro Villar[1], Rosana Montes[1], Ana María Sánchez[1] and Francisco Herrera[2]
[1]Department of Software Engineering, University of Granada, Granada, Spain; [2]Department of Computer Science & Artificial Intelligence, University of Granada, Granada, Spain.

Session TM-11	Granular Computing
Date/Time	Tuesday, 26 July 2016 / 2:30PM – 4:30PM
Venue	Room 223
Chair	George Panoutsos

2:30PM **F-16345** **Iterative Information Granulation for Novelty Detection in Complex Datasets.....953**
Adrian Rubio-Solis and George Panoutsos
Automatic Control and Systems Engineering Department, The University of Sheffield, UK.

2:50PM **F-16099** **Prediction Granules for Uncertainty Modelling.....961**
E. Lotfi[1], A. Khosravi[2] and S. Nahavandi[3]
[1]Department of Computer Engineering, Torbat-e-Jam Branch, Islamic Azad University, Torbat-e-Jam, Iran; [2]Center for Intelligence Systems Research, Deakin University, Geelong 3217, Australia; [3]Engineering, Director — Centre for Intelligent Systems Research, Deakin University, 75, Pigdons Road, Waurn Ponds, Victoria 3216, Australia.

3:10PM **F-16109** **Granular Description of Data: Building Information Granules with the aid of the Principle of Justifiable Granularity.....969**
Xiubin Zhu[1], Witold Pedrycz[1,2,3] and Zhiwu Li[1,4]
[1]School of Electro-Mechanical Engineering, Xidian University, Xi'an, 710071, China; [2]Department of Electrical and Computer Engineering, University of Alberta, Edmonton, T6R 2V4 AB, Canada; [3]Faculty of Engineering, King Abdulaziz University, Jeddah, 21589, Saudi Arabia; [4]Institute of Systems Engineering, Macau University of Science and Technology, Taipa, Macau.

3:30PM	**F-16543**	**Layered Information Granulation Based on Non-Transitive, Perceptual Indistinguishability.....977** Hedda R. Schmidtke *University of Oregon, Eugene, Oregon, 97403-1251, USA*
3:50PM	**F-16055**	**Converting Spatiotemporal Data Among Heterogeneous Granularity Systems.....984** Muhao Chen[1], Shi Gao[1] and X. Sean Wang[2] *[1]University of California, Los Angeles, USA; [2]Fudan University, China.*
4:10PM	**F-16023**	**Generation of Linguistic Membership Functions From Word Vectors.....993** Thomas A. Runkler *Siemens AG, Corporate Technology, 80200, Munich, Germany.*

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Date/Time	Tuesday, 26 July 2016 / 4:30PM – 6:30PM
Venue	Room 220
Chair	Qun Ren

4:30PM	**F-16464**	**Discrete-time Parallel Robot Motion Control Using Adaptive Neuro-Fuzzy Inference System Based on Improved Subtractive Clustering.....1000** Qun Ren and Pascal Bigras *Department of Automatic Manufacturing Engineering, École de technologie supérieure, University of Quebec, Montreal, QC, Canada.*
4:50PM	**F-16125**	**Reinforcement Learning in the Guarding a Territory Game.....1007** Chidozie V. Analikwu and Howard M. Schwartz *Department of Systems and Computer Engineering, Carleton University, 1125 Colonel By Drive, Ottawa, Ontario, Canada.*
5:10PM	**F-16212**	**Kalman Fuzzy Actor-Critic Learning Automaton Algorithm for the Pursuit-Evasion Differential Game.....1015** Ahmad A. Al-Talabi[1,2] and Howard M. Schwartz[1] *[1]Department of Systems and Computer Engineering, Carleton University, 1125 Colonel By Drive, Ottawa, ON, K1S 5B6, Canada; [2]Mechatronics Engineering Department, Al-Khwarizmi College of Engineering, Baghdad University, Baghdad, Iraq*
5:30PM	**F-16295**	**A Comparative Study on the Control of Quadcopter UAVs by Using Singleton and Non-Singleton Fuzzy Logic Controllers.....1023** Changhong Fu[1,2], Andriy Sarabakha[1,2], Erdal Kayacan[1], Christian Wagner[3], Robert John[3] and Jonathan M. Garibaldi[3] *[1]School of Mechanical and Aerospace Engineering, Nanyang Technological University (NTU), 50 Nanyang Avenue, 639798, Singapore; [2]ST Engineering-NTU Corp Laboratory, 50 Nanyang Avenue, 639798, Singapore; [3]Lab for Uncertainty in Data and Decision Making (LUCID), School of Computer Science, University of Nottingham, Nottingham, United Kingdom.*

5:50PM	**F-16383**	**Fuzzy Logic in VANET Context Aware Congested Road and Automatic Crash Notification.....1031** Lobna Nassar and Fakhri Karray *Electrical & Computer Engineering, University of Waterloo, Waterloo, ON, Canada.*

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Date/Time	Tuesday, 26 July 2016 / 4:30PM – 6:30PM
Venue	Room 221
Chair	Francisco Herrera - Luis Martínez / Marek Reformat

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4:50PM	**F-16552**	**A Linguistic Partner Evaluation Model in Tourism Supply Chain Networks.....1051** Narongsak Pongsathornwiwat[1], Van-Nam Huynh[1], Thanaruk Theeramunkong[2] and Chawalit Jeenananta[2] *[1]School of Knowledge Science, Japan Advanced Institute of Science and Technology, Nomi, Ishikawa, 923-1292, Japan; [2]School of Information, Communication and Technology, Sirindhorn International Institute of Technology, Thammasat University, PathumThani, 12000, Thailand.*
5:10PM	**F-16555**	**Linked Opened Data: Conjunctive Information and Participatory Learning Process.....1059** Marek Z. Reformat[1] and Ronald R. Yager[2] *[1]Electrical and Computer Engineering, University of Alberta, Edmonton, Canada; [2]Machine Intelligence Institute, Iona College, New York, USA.*
5:30PM	**F-16210**	**Genetic Fuzzy Markup Language-based Item Response Theory Agent for Online Self-Learning Platform Construction.....1067** Chang-Shing Lee[1,2], Mei-Hui Wang[1], Koun-Hong Lin[2], Sheng-Chi Yang[2] and Ting-Tzu Lin[1] *[1]Department of Computer Science and Information Engineering, National University of Tainan, Tainan, Taiwan; [2]Center for Research of Knowledge Application & Web Service, National University of Tainan, Tainan, Taiwan.*
5:50PM	**F-16232**	**FML-based Feature Similarity Assessment Agent for Japanese/Taiwanese Language Learning.....1073** Chang-Shing Lee[1], Mei-Hui Wang[1], Shoji Nohara[2], Kuan-Yi Wu[1] and Ryosuke Saga[2] *[1]Department of Computer Science and Information Engineering, National University of Tainan, Tainan, Taiwan; [2]Department of Computer Science and Intelligent System, Osaka Prefecture University, Osaka, Japan.*

6:10PM **F-16301** **A Virtual Machine for Event Sequence Identification Using Fuzzy Tolerance.....1080**
Trevor Martin[1,2] and Ben Azvine[2]
[1]Machine Intelligence and Uncertainty Lab, Engineering Maths, University of Bristol, Bristol, BS8 1UB, UK; [2]Security Futures Lab, BT TSO, Adastral Park, Ipswich, IP5 3RE, UK

6:30PM **F-16557** **Validation and Implementation of Fuzzy Models Using FML-based Specifications.....1088**
Mehran Panahi Akhavan, Majid RobatJazi and Marek Z. Reformat
Electrical and Computer Engineering, University of Alberta, Edmonton, Canada.

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Date/Time	Tuesday, 26 July 2016 / 4:30PM – 6:30PM
Venue	Room 222
Chair	Derek T. Anderson

4:30PM **F-16194** **Fuzzy Models of Topological Relationships Based on the PHI-Descriptor.....1096**
P. Matsakis and M. Naeem
School of Computer Science, University of Guelph, Ontario, Canada.

4:50PM **F-16289** **Fuzzy Partitions for Texture Modelling Adapted to the Subjectivity of Human Perception.....1105**
Pedro Manuel Martínez-Jiménez[1], Jesús Chamorro-Martínez[1] and José Manuel Soto-Hidalgo[2]
[1]Department of Computer Science and Artificial Intelligence, University of Granada, Spain; [2]Department of Computer Architecture, Electronics and Electronic Technology, University of Córdoba, Spain

5:10PM **F-16299** **A Deep-Neuro-Fuzzy Approach for Estimating the Interaction Forces in Robotic Surgery.....1113**
Angelica I. Aviles[1], Samar M. Alsaleh[2], Eduard Montseny[3], Pilar Sobrevilla[4] and Alicia Casals[5]
[1]Research Center of Biomedical Engineering, Universitat Politécnica de Cataluya, Spain; [2]Department of Computer Science, George Washington University, USA; [3]Automatic Control Department, Universitat Politécnica de Cataluya, Spain; [4]Department of Applied Mathematics II, Universitat Politécnica de Cataluya, Spain; [5]Institute for Bioengineering of Catalonia, Spain.

5:30PM **F-16305** **Linguistic Descriptors and Fuzzy Sets in Face Recognition Realized by Humans.....1120**
Adam Kiersztyn[1], Paweł Karczmarek[1], Michał Dolecki[1] and Witold Pedrycz[2]
[1]Institute of Mathematics and Computer Science, The John Paul II Catholic University of Lublin, ul. Konstantynów 1H, 20-708, Lublin, Poland; [2]Department of Electrical & Computer Engineering, University of Alberta Edmonton T6R 2V4 AB, Canada, Department of Electrical and Computer Engineering, King Abdulaziz University, Jeddah, 21589, Saudi Arabia and Systems Research Institute, Polish Academy of Sciences, Warsaw, Poland.

5:50PM **F-16453** **Fuzzy-Rough Based Decision System for Gait adopting Instance Selection.....1127**
Abhishek Jhawar[1], Chee Seng Chan[1], Dorothy Monekosso[2] and Paolo Remagnino[3]
[1]Centre of Image and Signal Processing, Faculty of Computer Science and Information Technology, University of Malaya, 50603 Kuala Lumpur, Malaysia; [2]AET, School of Computing, Leeds Beckett University, Leeds, UK; [3]Robot Vision Team, Faculty of Science, Engineering and Computing, Kingston University, London, UK.

6:10PM **F-16502** **A Novel Fuzzy Feature Encoding Approach for Image Classification.....1134**
Umit L. Altintakan[1] and Adnan Yazici[2]
[1]Department of Computer Engineering, Air Force Academy, Istanbul, Turkey; [2]Department of Computer Engineering, Middle East Technical University, Ankara, Turkey.

Session TP-11	Theory of Fuzzy Systems and Fuzzy Control
Date/Time	Tuesday, 26 July 2016 / 4:30PM – 6:30PM
Venue	Room 223
Chair	Donghwan Lee

4:30PM **F-16188** **Local State-Feedback Stabilization of Nonlinear Fuzzy Systems with Measurement Errors in the State.....1140**
Donghwan Lee and Jianghai Hu
Department of Electrical and Computer, Engineering, Purdue University, West Lafayette, IN 47906, USA.

4:50PM **F-16020** **Conditions of Stabilization of Positive Continuous Takagi-Sugeno Fuzzy Systems with Delay.....1147**
Abdellah Benzaouia[1] and Ahmed El Hajjaji[2]
[1]LAEPT URAC 28, University Cadi Ayyad, Faculty of Science Semlalia, BP 2390, Marrakech, Morocco; [2]University of Picardie Jules Vernes (UPJV), 33, rue Saint, Leu 80039 Amiens Cedex 1, France.

5:10PM **F-16088** **Stabilization of Interconnected T-S Fuzzy Systems Using LMIs.....1154**
Abdellah Benzaouia[2], Laila El Younsi[2] and Ahmed El Hajjaji[1]
[1]MIS-University of Picardie Jules-Vernes, 7, Rue du, Moulin Neuf, 80000 Amiens, France; [2]LAEPT-URAC 28, University Cadi, Ayyad, Faculty of Science Semlalia, P.B. 2390, Marrakech, Morocco.

5:30PM **F-16132** **Controller Design for T-S Fuzzy Singularly Perturbed Switched Systems.....1159**
Xiaoping Ma, Qianjin Wang, Jian Cheng, Yinan Guo, Chunyu Yang and Linna Zhou
School of Information and Electrical Engineering, China University of Mining and Technology, Xuzhou, 221116, P.R. China.

5:50PM **F-16242** **Improvement of Reliable H_∞ Control for Discrete-Time Fuzzy Systems with Time-Varying Delays.....1167**
Shenquan Wang[1,2], Yulian Jiang[1], Yuanchun Li[1] and Derong Liu[3]
[1]College of Electrical and Electronic Engineering, Changchun University of Technology, Changchun, 130012, China; [2]The State Key Laboratory of Management and Control for Complex Systems, Institute of Automation, Chinese Academy of Sciences, Beijing, 100190, China; [3]School of Automation and Electrical Engineering, University of Science and Technology Beijing, Beijing, 100083, China.

Session WA-8	Fuzzy Pattern Recognition
Date/Time	Wednesday, 27 July 2016 / 8:00AM – 10:00AM
Venue	Room 220
Chair	Christian Wagner

8:00AM **F-16336** **Modelling Uncertainty in Production Processes Using Non-Singleton Fuzzification and Fuzzy Cognitive Maps — A Virgin Olive Oil Case Study.....1173**
P. Cano Marchal[1], C. Wagner[2], J. Gámez García[1] and J. Gómez Ortega[1]
[1]Robotics, Automation and Computer Vision Group, University of Jaén. Agrifood Campus of International Excellence (ceiA3). Jaén, Spain; [2]Lab for Uncertainty in Data and Decision Making (LUCID), School of Computer Science, University of Nottingham

8:20AM **F-16103** **Fuzzy Clustering Based Traffic Pattern Identification.....1181**
Tianjun Li, Long Chen and C. L. Philip Chen
Department of Computer and Information Science, University of Macau, Taipa, Macau, China.

8:40AM **F-16312** **A New Exponential Naive Bayes Classifier with Fuzzy Parameters.....1188**
Anny K. G. Rodrigues, Thiago V. V. Batista, Ronei M. Moraes and Liliane S. Machado
LabTEVE — Federal University of Paraiba — Joao Pessoa/PB, 58051 — 900, Brazil.

9:00AM **F-16362** **Fuzzy Relative Entropy Based Classification Scheme for Discrimination of Odors/Gases Using a Poorly Selective Sensor Array.....1195**
Shilpa Sharma and Ravi Kumar
Department of Electronics and Communication Engineering, Thapar University, Patiala, India.

9:20AM **F-16461** **Knowledge Extraction from a Time-Series Using Segmentation, Fuzzy Matching and Predictor Graphs.....1201**
Jishnu Mukhoti[1], Pratyusha Rakshit[2], Diptendu Bhattacharya[2], Amit Konar[2] and Atulya K. Nagar[3]
[1]Department of Computer Science and Engineering, Jadavpur University, Kolkata, India; [2]Department of Electronics and Telecommunication Engineering, Jadavpur University, Kolkata, India; [3]Department of Math and Computer Science, Liverpool Hope University, Liverpool, UK

9:40AM	**F-16475**	**Optimized Fuzzy Image Reconstruction Algorithm for ECT Systems.....1209** Wael A. Deabes[1,3], Hesham H. Amin[1,4] and Mohamed Abdelrahman[2] *[1]Computer Science Dept., University College, Umm Al-Qura University, Makkah, KSA; [2]Electrical Engineering and Computer Science, Texas A&M University-Kingsville, TX, USA; [3]Computer and System Dept., Faculty of Engineering, Mansoura University, Egypt; [4]Computer Systems Dept., Aswan Faculty of Engineering, Aswan University, Aswan, Egypt.*

Session WA-9	SS FUZZ-IEEE-12: The Theory of Type-2 Sets and Systems (T2-T) / SS FUZZ-IEEE-20A: Intelligent Medical Science
Date/Time	Wednesday, 27 July 2016 / 8:00AM – 10:00AM
Venue	Room 221
Chair	Robert John / Gerald Schaefer

8:00AM	**F-16215**	**Towards General Forms of Interval Type-2 Fuzzy Logic Systems.....1216** Gonzalo Ruiz[1], Héctor Pomares[1] and Ignacio Rojas[1] and Hani Hagras[2] *[1]Department of Computer Architecture and Computer, Universidad de Granada, Granada, Spain; [2]The Computational Intelligence Centre, School of Computer Science and Electronic Engineering, University of Essex, United Kingdom*
8:20AM	**F-16229**	**Maclaurin Series Expansion Complexity-Reduced Center of Sets Type-Reduction + Defuzzification for Interval Type-2 Fuzzy Systems.....1224** Mojtaba Ahmadieh Khanesar[1] and Jerry M. Mendel[2] *[1]Department of Electrical and Control Engineering, Semnan University, Semnan, 35131, Iran; [2]Signal and Image Processing Institute, University of Southern California, Los Angeles, 90089-2564, CA, USA*
8:40AM	**F-16139**	**Closed Form Solutions for the Type Reduction of General Type-2 Fuzzy Sets with Piecewise Linear Membership Functions.....1232** Xinwang Liu and Wei Du *School of Economics and Management, Southeast University, Nanjing, Jiangsu, 210096.*
9:00AM	**F-16398**	**Instability Conditions for Type-1 and Type-2 TSK Fuzzy Systems.....1240** Saeed Jafarzadeh[1] and M. Sami Fadali[2] *[1]California State University Bakersfield, United States; [2]University of Nevada, Reno, United States.*
9:20AM	**F-16494**	**Effective Classification of HEp-2 Cells using Fuzzy Texture Descriptors.....1248** Gerald Schaefer[1] and Niraj P. Doshi[2] *[1]Department of Computer Science, Loughborough University, Loughborough, UK; [2]dMacVis Research Lab, India*

Session WA-10	SS FUZZ-IEEE-18: Handling Uncertainties in Big Data by Fuzzy Systems
Date/Time	Wednesday, 27 July 2016 / 8:00AM – 10:00AM
Venue	Room 222
Chair	Jie Lu

8:00AM **F-16321** **A Fast Load Pattern Extraction Approach Based on Dimension Reduction and Sampling.....1253**
Tiefeng Zhang[1], Mingdi Gu[1], Guangquan Zhang[2] and Jie Lu[2]
[1]School of Electric and Electronic Engineering, North China Electric Power University, Baoding, China; [2]Centre for Quantum Computation & Intelligent Systems, Faculty of Engineering and Information Technology, University of Technology, Sydney, Sydney, Australia.

8:20AM **F-16381** **A Multi-objective Optimization Model for Virtual Machine Mapping in Cloud Data Centres.....1259**
Fahimeh Ramezani[1], Mohsen Naderpour[2] and Jie Lu[1,2]
[1]Centre for Quantum Computation & Intelligent Systems, Faculty of Engineering and Information Technology, University of Technology Sydney (UTS), PO Box 123, Broadway NSW 2007, Australia; [2]Global Big Data Technologies Centre, Faculty of Engineering and Information Technology, University of Technology Sydney (UTS) PO Box 123, Broadway NSW 2007, Australia.

8:40AM **F-16393** **Enhancing Cross Domain Recommendation with Domain Dependent Tags.....1266**
Peng Hao, Guangquan Zhang and Jie Lu
Centre for Quantum Computation and Intelligent Systems, Faculty of Engineering and Information Technology, University of Technology Sydney, Sydney, 2007, Australia.

9:00AM **F-16395** **Fuzzy User-interest Drift Detection based Recommender Systems.....1274**
Qian Zhang, Dianshuang Wu, Guangquan Zhang and Jie Lu
Decision Systems and e-Service Intelligence Laboratory, Centre for Quantum Computation & Intelligent Systems, Faculty of Engineering and Information Technology, University of Technology Sydney, Australia.

9:20AM **F-16113** **Allocating Optimized Resources in the Cloud by a Viable SLA Model.....1282**
Walayat Hussain[1], Farookh Hussain[1] and Omar Hussain[2]
[1]School of Software, Decision Support and e-Service Intelligence Lab, Centre for Quantum Computation & Intelligent Systems, University of Technology Sydney. Sydney, Australia; [2]School of Business, University of New South Wales Canberra (UNSW Canberra), Australian Defence Force Academy, Canberra, ACT, 2601, Australia.

9:40AM **F-16255** **Exploring Technology Integration in Education Using Fuzzy Representation and Feature Selection.....1288**
Jie Yang[1], Jun Ma[1] and Sarah K. Howard[2]
[1]SMART Infrastructure Facility, Faculty of Engineering and Information Sciences, University of Wollongong, Northfields Ave, Wollongong, NSW 2522, Australia; [2]School of Education, Faculty of Social Science, University of Wollongong, Northfields Ave, Wollongong, NSW 2522, Australia.

Session WA-11	Approximate Reasoning
Date/Time	Wednesday, 27 July 2016 / 8:00AM – 10:00AM
Venue	Room 223
Chair	Martin Stepnicka

8:00AM **F-16256** **A Proposal for an Intuitionistic Fuzzy Inference System.....1294**
Amaury Hernandez-Aguila, Mario Garcia-Valdez and Oscar Castillo
Tijuana Institute of Technology, Division of Graduate Studies and Graduates, Tijuana, Mexico.

8:20AM **F-16489** **On the Sensitivity of Type-2 Fuzzy Signatures and the Generalizations of the Extension Principle.....1301**
István Á. Harmati[1] and László T. Kóczy[2]
[1]Department of Mathematics and Computational Sciences, Széchenyi István University, Györ, Egyetem tér 1., 9026 Hungary; [2]Department of Automation, Széchenyi István University, Györ, Egyetem tér 1., 9026 Hungary Department of Telecommunication and Mediainformatics, Budapest University of Technology and Economics, Hungary.

8:40AM **F-16554** **Fuzzy Approximate Reasoning: Logic, Intuition or Comparison?.....1308**
Valerie V. Cross
Computer Science and Software Engineering, Miami University, Oxford, OH, 45066, USA.

9:00AM **F-16600** **Transformation-Based Constraint-Guided Generalised Modus Ponens.....1316**
Michaël Blot, Marie-Jeanne Lesot and Marcin Detyniecki
Sorbonne Universités, LIP6, UPMC Univ Paris 06, CNRS, UMR 7606, F-75005, Paris, France.

Session	[Plenary] – Sparse Fuzzy Modeling, Prof. Nikhil R. Pal
Date/Time	Wednesday, 27 July 2016 / 1:00PM – 2:00PM
Venue	Ballroom B
Chair	Oscar Cordón

Session WM-8	Fuzzy Image Processing
Date/Time	Wednesday, 27 July 2016 / 2:30PM – 4:30PM
Venue	Room 220
Chair	Belen Prados-Suarez

2:30PM **F-16029** **Fuzzy Techniques Provide a Theoretical Explanation for the Heuristic l_p-Regularization of Signals and Images.....1323**
Fernando Cervantes[1], Brian Usevitch[1], Leobardo Valera[2], Vladik Kreinovich[2] and Olga Kosheleva[2]
[1]Department of Electrical and Computer Engineering, University of Texas at El Paso, 500 W. University, El Paso, TX 79968, USA; [2]Computational Science Program, University of Texas at El Paso, El Paso, TX 79968, USA.

2:50PM **F-16042** **Removing Noise in a Digital Image Using a New Entropy Method Based on Intuitionistic Fuzzy Sets.....1328**
Rahman Farnoosh[1], Mohamadtaghi Rahimi[1] and Pranesh Kumar[2]
[1]Department of Mathematics, Iran University of Science and Technology, Tehran, Iran; [2]Department of Mathematics and Statistics, University of Northern British Columbia, Prince George, BC, Canada.

3:10PM **F-16163** **Multi-Value Image Segmentation Based on FCM Algorithm and Graph Cut Theory.....1333**
Mengting Xu[1], Min Guo[1], Lin Shang[1] and Xiuyi Jia[2]
[1]Key Laboratory, of Novel Software Technology, Nanjing University, Nanjing, 210046, China; [2]School of Computer Science and Engineering, Nanjing University of Science and Technology, Nanjing, 210094, China.

3:30PM **F-16290** **Robust Image Segmentation Using Global and Local Fuzzy Energy Based Active Contour.....1341**
Ajoy Mondal[1], K. Ramachandra Murthy[1], Ashish Ghosh[1] and Susmita Ghosh[2]
[1]Machine Intelligence Unit, Indian Statistical Institute, Kolkata-700108, India; [2]Department of CSE, Jadavpur University, Kolkata-700032, India.

3:50PM **F-16506** **Enhancement of Night Movies Using Fuzzy Representation of Images.....1349**
Petr Hurtik[1], Marek Vajgl[1] and Nicolás Madrid[2]
[1]Institute for Research and Applications of Fuzzy Modeling, University of Ostrava, Centre of Excellence IT4Innovations, Czech Republic; [2]Departamento de Matemática Aplicada, University of Málaga, Spain.

4:10PM **F-16496** **Edge Image Aggregation Method Using Ordered Weighted Averaging Functions.....1355**
Manuel González-Hidalgo, Sebastia Massanet, Arnau Mir and Daniel Ruiz-Aguilera
Department of Mathematics and Computer Science, University of the Balearic Islands, Carretera de Valldemossa, km 7.5, E-07122, Palma (Illes Balears), Spain.

Session WM-9	SS FUZZ-IEEE-15A: Methods and Applications of Fuzzy Cognitive Maps
Date/Time	Wednesday, 27 July 2016 / 2:30PM – 4:30PM
Venue	Room 221
Chair	Elpiniki I. Papageorgiou

2:30PM **F-16082** **Partitive Granular Cognitive Maps to Graded Multilabel Classification.....1363**
Gonzalo Nápoles[1,2], Rafael Falcon[3], Elpiniki Papageorgiou[1,4], Rafael Bello[2] and Koen Vanhoof[1]
[1]Hasselt Universiteit Campus Diepenbeek, Agoralaan Gebouw D, BE3590 Diepenbeek, Belgium; [2]Computer Science Department, Central University of Las Villas, Carretera Camajuaní Km 5.5, 54830 Santa Clara, Cuba; [3]Electrical Engineering and Computer Science, University of Ottawa, 800 King Edward Ave., Ottawa, ON K1N 6N5, Canada; [4]Department of Computer Engineering, Technological Educational Institute of Central Greece, 30 Km Old National Road Lamia-Athens, TK 35100, Lamia, Greece.

2:50PM **F-16352** **Fuzzy Cognitive Map for Visual Servoing of Flying Robot.....1371**
Abdollah Amirkhani[1], Masoud Shirzadeh[1], Elpiniki I. Papageorgiou[2,3] and Mohammad R. Mosavi[1]
[1]Department of Electrical Engineering, Iran University of Science and Technology, Tehran, 16846-13114, Iran; [2]Computer Engineering Department, Technological Educational Institute of Central Greece, Lamia, Greece; [3]Faculty of Business Economics, Hasselt University, Martelarenlaan 42, Hasselt, 35900, Belgium

3:10PM **F-16200** **Building a Cardiovascular Disease Predictive Model Using Structural Equation Model & Fuzzy Cognitive Map.....1377**
Manpreet Singh, Levi Monteiro Martins, Patrick Joanis and Vijay K. Mago
Lakehead University, Thunder Bay, Ontario P7B 5E1, Canada.

3:30PM **F-16221** **Comparison of Stakeholder-Generated Fcms Across Generation Methods And Metrics — A Report from the Field.....1383**
Diana Reckien
Department of Urban and Regional Planning and Geo-Information Management, Faculty of Geo-Information Science and Earth Observation (ITC), University of Twente, Enschede, The Netherlands.

3:50PM **F-16222** **Identifying Most Feasible Adaptation Options to Heatwaves and Heavy Rain Events in New York City — Fuzzy Cognitive Mapping as a Versatile Tool to Investigate How to Prepare for Climate Change.....1391**
Diana Reckien
Department of Urban and Regional Planning and Geo-Information Management, Faculty of Geo-Information Science and Earth Observation (ITC), University of Twente, Enschede, The Netherlands.

4:10PM **F-16302** **A New Learning Approach for Fuzzy Cognitive Maps Based on System Performance Indicators.....1398**
Łukasz Kubuś, Katarzyna Poczęta and Alexander Yastrebov
Department of Information Systems, Kielce University of Technology, al. Tysiąclecia Państwa Polskiego 7 25-314 Kielce, Poland.

Session WM-10	SS FUZZ-IEEE-16A: Evolutionary Fuzzy Systems
Date/Time	Wednesday, 27 July 2016 / 2:30PM – 4:30PM
Venue	Room 222
Chair	Yusuke Nojima

2:30PM **F-16596** **Multiobjective Fuzzy Genetics-Based Machine Learning with a Reject Option.....1405**
Yusuke Nojima and Hisao Ishibuchi
Department of Computer Science and Intelligent Systems, Graduate School of Engineering, Osaka Prefecture University, Sakai, Osaka 599-8531, Japan.

2:50PM **F-16176** **On the use of an Incremental Approach to Learn Fuzzy Classification Rules for Big Data Problems.....1413**
Juan Carlos Gámez[1], David García[2], Antonio González[2] and Raúl Pérez[2]
[1]Department of Computer Engineering, Electronic and Electronic Technology, University of Cordoba, Córdoba, Spain; [2]Department of Computer Science and Artificial Intelligence, ETSIIT, University of Granada, Granada, Spain.

3:10PM **F-16190** **A Genetic Fuzzy System for Large-scale Regression.....1421**
I. Rodríguez-Fdez, M. Mucientes and A. Bugarín
Centro Singular de Investigación en Tecnoloxías da Información (CiTIUS), Universidade de Santiago de Compostela Santiago de Compostela, Spain.

3:30PM **F-16217** **Extensions of the DECO$_3$R Algorithm for Generating Compact and Cooperating Fuzzy Rule-Based Classification Systems.....1429**
Nikolaos L. Tsakiridis[1], John B. Theocharis[1], Raúl Pérez[2], Antonio González[2] and George C. Zalidis[3]
[1]Department of Electrical and Computer Engineering, Aristotle University of Thessaloniki, Thessaloniki, Greece; [2]Department of Computer Sciences and Artificial Intelligence, University of Granada, Granada, Spain; [3]Faculty of Agriculture, Aristotle University of Thessaloniki, Thessaloniki, Greece.

3:50PM **F-16456** **A First Approach in Evolutionary Fuzzy Systems Based on the Lateral Tuning of the Linguistic Labels for Big Data Classification.....1437**
Alberto Fernández[1], Sara del Río[2] and Francisco Herrera[2]
[1]Department of Computer Science, University of Jaén, Spain; [2]Department of Computer Science and A.I., University of Granada, Spain.

4:10PM **F-16514** **Imbalanced Datasets in the Generation of Fuzzy Classification Systems — An Investigation Using a Multiobjective Evolutionary Algorithm Based on Decomposition.....1445**
Edward Hinojosa Cárdenas[1], Heloisa A. Camargo[2] and Yván J. Túpac[3]
[1]National University of San Agustin, Arequipa, Peru; [2]Federal University of São Carlos, São Carlos, Brazil; [3]San Pablo Catholic University, Arequipa, Peru.

Session WM-11	Fuzzy Mathematics
Date/Time	Wednesday, 27 July 2016 / 2:30PM – 4:30PM
Venue	Room 223
Chair	Peter Sussner

2:30PM **F-16529** **Controlling the Width of the Sum of Interactive Fuzzy Numbers with Applications to Fuzzy Initial Value Problems.....1453**
Peter Sussner, Estevão Esmi and Laécio C. Barros
Department of Applied Mathematics, University of Campinas, Brazil, Campinas, SP 13083-859, Brazil.

2:50PM **F-16220** **A Further Study on Contraction-Expansion Rationality Conditions of Fuzzy Choice Functions.....1461**
Zhiming Hu[1] and Zhenhua Jiao[2]
[1]School of Shanghai University of Finance and Economics, Zhejiang College, Jinhua, Zhejiang, 321013, China; [2]School of Science, Hangzhou Dianzi University, Hangzhou, Zhejiang, 310018, China.

3:10PM **F-16309** **The Prediction of Cardiovascular Disorders by Fuzzy Difference Equations.....1465**
T. Allahviranloo[1], M. Keshavarz[1] and Sh. Islam
[1]Department of Mathematics Science and Research Branch, Islamic Azad University, Tehran, Iran; [2]Department of Mathematics and Statistics, University of Prince Edward Island, 550, University Ave, Charlottetown, Canada.

3:30PM **F-16445** **A Novel Technique for Solving Fuzzy Differential Equations of Fractional Order Using Laplace and Integral Transforms.....1473**
Soheil Salahshour[1], Ali Ahmadian[2] and Chee Seng Chan[2]
[1]Young Researchers and Elite Club, Mobarakeh Branch, Islamic Azad University, Mobarakeh, Iran; [2]Centre of Image and Signal Processing, Faculty of Computer Science and Information Technology, University of Malaya, 50603 Kuala Lumpur, Malaysia.

3:50PM **F-16477** **Comparison of Formulations of Applied Tasks with Intervals, Fuzzy Sets and Probability Approaches.....1478**
Boris Kovalerchuk[1] and Vladik Kreinovich[2]
[1]Department of Computer Science, Central Washington University, Ellensburg, WA, USA; [2]Department of Computer Science, University of Texas at El Paso, El Paso, TX, USA.

Session WP-8	Fuzzy Clustering
Date/Time	Wednesday, 27 July 2016 / 4:30PM – 6:30PM
Venue	Room 220
Chair	Susana Vieira

4:30PM **F-16344** **Analysis of Residential Natural Gas Consumers Using Fuzzy C-Means Clustering.....1484**
Marta P. Fernandes, Joaquim L. Viegas, Susana M. Vieira and João M. Sousa
IDMEC, Instituto Superior Técnico, Universidade de Lisboa

4:50PM **F-16022** **Hyperspherical Fuzzy Clustering for Online Document Categorization.....1487**
Jian-Ping Mei[1] and Yangtao Wang[2]
*[1]College of Computer Science and Technology, Zhejiang University of Technology, Hangzhou, 310023, China; [2]Data Analytics Department, Institute for Infocomm Research, A*STAR, 138632, Singapore .*

5:10PM **F-16043** **Self-updating Clustering Algorithm for Interval-valued Data.....1494**
Wen-Liang Hung[1], Jenn-Hwai Yang[2] and Kuan-Fu Shen[3]
[1]Department of Applied Mathematics, National Hsinchu University of Education, Hsin-Chu, Taiwan, Hsin-Chu, Taiwan; [2]Institute of Biomedical Sciences, Academia Sinica, Taipei, Taiwan; [3]Department of Finance, Chien Hsin University of Science and Technology, Taoyuan, Taiwan.

5:30PM **F-16183** **Sampling-Based Consensus Fuzzy Clustering on Big Data.....1501**
Mohamed Ali Zoghlami, Minyar Sassi Hidri and Rahma Ben Ayed
Université de Tunis El Manar, Ecole Nationale d'Ingénieurs de Tunis, BP. 37, Le Belvèdère 1002, Tunis, Tunisia.

5:50PM **F-16488** **Fuzzy Processing in Surveillance Wireless Sensor Networks.....1509**
Seyyit Alper Sert, Adnan Yazici and Tansel Dokeroglu
Department of Computer Engineering, Middle East Technical University, Ankara / Turkey.

6:10PM **F-16556** **A Flexible Possibilistic C-Template Shell Clustering Method with Adjustable Degree of Deformation.....1516**
Tsaipei Wang
Department of Computer Science, National Chiao Tung University, Hsinchu City, Taiwan, R.O.C.

Session WP-9	SS FUZZ-IEEE-15B: Methods and Applications of Fuzzy Cognitive Maps
Date/Time	Wednesday, 27 July 2016 / 4:30PM – 6:30PM
Venue	Room 221
Chair	Elpiniki I. Papageorgiou

4:30PM **F-16409** **Hybrid Model for Water Demand Prediction Based on Fuzzy Cognitive Maps and Artificial Neural Networks.....1523**
Elpiniki I. Papageorgiou[1,2], Katarzyna Poczęta[3] and Chrysi Laspidou[4,5]
[1]Department of Computer Engineering, Technological Educational Institute (T.E.I.) of Central Greece, 3rd Km Old National Road Lamia-Athens, Lamia 35100, Greece; [2]Business Administration, Faculty of Business Economics, Hasselt University, Belgium; [3]Department of Information Systems, Kielce University of Technology, Kielce, Poland; [4]Department of Civil Engineering, University of Thessaly, Pedion Areos, Volos 38334, Greece; [5]Information Technologies Institute, Center for Research and Technology Hellas, CERTH, 6th km Charilaou-Thermi Rd., Thermi 57001, Greece

4:50PM **F-16404** **Personal Digital Assistant 2.0 — A Software Prototype for Cognitive Cities.....1531**
Patrick Kaltenrieder, Timur Altun, Sara D'Onofrio, Edy Portmann and Thomas Myrach
Institute of Information Systems, University of Bern, Bern, Switzerland

5:10PM **F-16441** **A Fuzzy Cognitive Map like Recommender System of Learning Resources.....1539**
Jose Aguilar[1], Priscila Valdiviezo-Díaz[2] and Guido Riofrio[2]
[1]CEMISID, Departamento de Computación, Universidad de Los Andes, Mérida, Venezuela, Prometeo researcher, UTPL, Loja, Ecuador; [2]Depto. de Ciencias de la Computación y Electrónica, Universidad Técnica Particular de Loja, Ecuador,

5:30PM **F-16503** **Multilayer Cognitive Maps to Model Problems.....1547**
José Aguilar[1], José Hidalgo[1], Fernando Osuna[1] and Nelson Pérez[2]
[1]CEMISID, Departamento de Computación, Universidad de Los Andes, Mérida, Venezuela; [2]GITEL, Departamento de Electrónica y Comunicaciones, Universidad de Los Andes, Mérida, Venezuela.

5:50PM **F-16457** **Collective Awareness in Smart City with Fuzzy Cognitive Maps and Fuzzy Sets.....1554**
Giuseppe D'Aniello[1], Angelo Gaeta[1], Matteo Gaeta[1], Vincenzo Loia[2] and Marek Z. Reformat[3]
[1]Dip. di Ingegneria dell'Informazione, Ingegneria Elettrica e Matematica Applicata, University of Salerno, Fisciano, Italy; [2]Dip. di Studi e Ricerche Aziendali, Management & Information Technology, University of Salerno, Fisciano, Italy; [3]Department of Electrical and Computer Engineering, University of Alberta, Edmonton, Alberta, Canada.

Session WP-10	FUZZ-IEEE-16B: Evolutionary Fuzzy Systems / SS FUZZ-IEEE-08: Advances to Type-2 Fuzzy Logic Control
Date/Time	Wednesday, 27 July 2016 / 4:30PM – 6:30PM
Venue	Room 222
Chair	Yusuke Nojima / Tufan Kumbasar

4:30PM **F-16487** **A Multi-Objective Evolutionary Fuzzy System for Big Data.....1562**
Andrea Ferranti, Francesco Marcelloni and Armando Segatori
Dipartimento di Ingegneria dell'Informazione, University of Pisa, Pisa, Italy.

4:50PM **F-16491** **Robust Evolving Cloud-based Control for the Distributed Solar Collector Field.....1570**
Goran Andonovski[1], Antonio Bayas[2], Doris Sáez[2], Sašo Blažič[1] and Igor Škrjanc[1]
[1]Faculty of Electrical Engineering, University of Ljubljana, Slovenia; [2]Department of Electrical Engineering, University of Chile, Chile.

5:10PM **F-16030** **Type-2 Fuzzified Flappy Bird Control System.....1578**
Atakan Sahin, Efehan Atici and Tufan Kumbasar
Control and Automation Engineering Department, Istanbul Technical University, Istanbul, Turkey.

5:30PM **F-16053** **Design and Experimental Validation of Single Input Type-2 Fuzzy PID Controllers as Applied to 3 DOF Helicopter Testbed.....1584**
Mohit Mehndiratta[1], Erdal Kayacan[1] and Tufan Kumbasar[2]
[1]Nanyang Technological University, School of Mechanical and Aerospace Engineering, 639798, Singapore; [2]Istanbul Technical University, Department of Control and Automation Engineering, 34469, Istanbul, Turkey.

5:50PM **F-16067** **Gradient Descent and Extended Kalman Filter Based Self-Tuning Interval Type-2 Fuzzy PID Controllers.....1592**
Ahmet Sakalli, Aykut Beke and Tufan Kumbasar
Istanbul Technical University, Faculty of Electrical and Electronics Engineering, Control and Automation Engineering Department, Maslak, TR-34469, Istanbul, Turkey.

Session WP-11	Fuzzy Optimization
Date/Time	Wednesday, 27 July 2016 / 4:30PM – 6:30PM
Venue	Room 223
Chair	David Pelta

4:30PM **F-16129** **A Improved Algorithm for Fuzzy Multistage Portfolio Optimization Model.....1599**
Guang Yang and Xinwang Liu
School of Economics and Management, Southeast University, Nanjing, Jiangsu, 211189, China.

4:50PM	**F-16140**	**A Robust Approach to a Class of Uncertain Optimization Problems with Imprecise Probabilities.....1606** Adam Kasperski and Paweł Zieliński *Faculty of Fundamental Problems of Technology, Wrocław University of Technology, Wybrzeże Wyspiańskiego 27, 50-370 Wrocław, Poland.*
5:10PM	**F-16196**	**Solving the Team Orienteering Problem with Fuzzy Scores and Constraints.....1614** Julio Brito, Airam Expósito and José A. Moreno *Department of Computer Engineering and Systems, University of La Laguna, E-38271, La Laguna, Spain.*
5:30PM	**F-16233**	**A Labeling Algorithm for Solving Intuitionistic Fuzzy Optimal Assignment Problems.....1621** A. Nagoorganis[1], J. Kavikumar[2], V. N. Mohamed[1] and A. H. Nor Shamsidah[2] *[1]Department of Mathematics, Jamal Mohamed College, Triuchirappalli, 620 020, India; [2]Faculty of Science, Technology & Human Development, Universiti Tun Hussein Onn Malaysia, Johor, 86400, Malaysia.*
5:50PM	**F-16537**	**Optimized Daily Diet Composition for a Nutritionally Balanced Diet: An Application of Fuzzy Multiple Objective Linear Programming.....1628** Mary Tom[1], Santoso Wibovo[2] and Susan Williams[3] *[1]School of Engineering and Technology, Central Queensland University, Brisbane, Australia; [2]School of Engineering and Technology, Central Queensland University, Melbourne, Australia; [3]School of Medical and Applied Sciences, Central Queensland University, Rockhampton, Australia.*

Session HA-8	Fuzzy Systems Modelling and Identification II
Date/Time	Thursday, 28 July 2016 / 8:00AM – 10:00AM
Venue	Room 220
Chair	Uzay Kaymak

8:00AM	**F-16454**	**Optimizing Probabilistic Fuzzy Systems for Classification Using Metaheuristics.....1635** Hugo M. Proença[1], Susana M. Vieira[1], Uzay Kaymak[2], R. J. Almeida[2] and João M. C. Sousa[1] *[1]LAETA, IDMEC, Instituto Técnico Lisboa, Universidade de Lisboa, Lisboa, 1049 — 001, Portugal; [2]Industrial Engineering & Innovation Sciences, Technische Universiteit Eindhoven, Eindhoven, 5600 MB, Netherlands.*
8:20AM	**F-16119**	**Recurrent Fuzzy System Design Using Mutation-Aided Elite Continuous Ant Colony Optimization.....1642** Chi-Chung Chen and Li Ping Shen *Department of Electrical Engineering, National Chiayi University, Chiayi City, Taiwan.*

8:40AM **F-16316** **Adaptive Fuzzy Controller Design Based on Robust Stability Linguistic Criterion and MOPSO.....1649**
Edson B. M. Costa and Ginalber L. O. Serra
Federal Institute of Education, Science and Technology, Department of Electroelectronics, Laboratory of Computational Intelligence Applied to Technology, Av. Getúlio Vargas, 04, Monte Castelo, CEP: 65030-005, São Luís — MA, Brazil.

9:00AM **F-16388** **A Methodology for the Description of Dynamical Systems in Hyperbox Space.....1657**
Sun Changping
Tianjin University of Technology, China

9:20AM **F-16402** **An Expansion of Local Granular Models in the Design of Incremental Model.....1664**
Myung-Won Lee[1], Keun-Chang Kwak[1] and Witold Pedrycz[2]
[1]Department of Control and Instrumentation Engineering, Chosun University, Gwangju, Korea; [2]Department of Electrical and Computer Engineering, University of Alberta, Edmonton, Canada.

9:40AM **F-16594** **Interval Type-2 Modified Fuzzy C-Regression Model Clustering Algorithm in TS Fuzzy Model Identification.....1671**
Tanmoy Dam and Alok Kanti Deb
Electrical Engineering Department, Indian Institute of Technology Kharagpur, Kharagpur-721302, India

Session HA-9	SS FUZZ-IEEE-22A: Fuzzy Decision-Making: Consensus and Missing Preferences
Date/Time	Thursday, 28 July 2016 / 8:00AM – 10:00AM
Venue	Room 221
Chair	Yucheng Dong - Raquel Ureña

8:00AM **F-16127** **A New Type of Preference Relations: Fuzzy Preference Relations with Self-Confidence.....1677**
Wenqi Liu[1], Yucheng Dong[1], Francisco Chiclana[2], Enrique Herrera-Viedma[3] and Francisco Javier Cabrerizo[4]
[1]Business School, Sichuan University, Chengdu, China; [2]Faculty of Technology, De Montfort University, Leicester, United Kingdom; [3]DECSAI, University of Granada, Granada, Spain; [4]Department Software Engineering and Computer Systems, UNED, Madrid, Spain.

8:20AM **F-16275** **A Context-aware Fuzzy Linguistic Consensus Model Supporting Innovation Processes.....1685**
Carmen De Maio[1], Giuseppe Fenza[2], Vincenzo Loia[2], Francesco Orciuoli[2] and Enrique Herrera-Viedma[3]
[1]Department of Information Engineering, Electrical Eng. and Applied Mathematics (DIEM), University of Salerno, 84084 Fisciano (SA), Italy; [2]Department of Management & Innovation Systems, University of Salerno, 84084 Fisciano (SA), Italy; [3]Department of Computer Science and Artificial Intelligence, University of Granada, Granada, Spain.

8:40AM **F-16354** **A Fuzzy Consensus Approach for Group Decision Making with variable Importance of Experts.....1693**
Giuseppe D'Aniello[1], Matteo Gaeta[1], Stefania Tomasiello[1] and Luigi Rarità[2]
[1]Dipartimento di Ingegneria dell'Informazione, Ingegneria Elettrica e Matematica Applicata, University of Salerno, Via Giovanni Paolo II, 132, 84084, Fisciano (SA), Italy; [2]CO.RI.SA., COnsorzio RIcerca Sistemi ad Agenti, University of Salerno, Via Giovanni Paolo II, 132, 84084, Fisciano (SA), Italy.

9:00AM **F-16160** **Minimum Adjustment-Based Consistency and Consensus Models for Group Decision Making with Interval Pairwise Comparison Matrices.....1701**
Zhen Zhang[1] and Chonghui Guo[2]
[1]Institute of Systems Engineering, Dalian University of Technology, Dalian, China; [2]Institute of Systems Engineering, Dalian University of Technology, Dalian, China.

9:20AM **F-16186** **A Consensus Accuracy Model for Group Decision Making with [0, 1] Reciprocal Preference Relations.....1709**
Ligang Zhou, Feng Wang, Peng Wu and Huayou Chen
School of Mathematical Science, Anhui University, Hefei, Anhui, 230601, China.

9:40AM **F-16203** **An Approach to Linguistic Group Decision Making Based on Unbalanced Linguistic Generalized Power Aggregation Operator.....1717**
Jiaming Zhu, Bing Han, Huayou Chen and Ligang Zhou
School of Mathematical Sciences, Anhui University, China.

Session HA-10	SS FUZZ-IEEE-14: Fuzzy Systems on Renewable Energy / SS FUZZ-IEEE-34: Methods of Operations Research For Decision Support Under Uncertainty
Date/Time	Thursday, 28 July 2016 / 8:00AM – 10:00AM
Venue	Room 222
Chair	Faa-Jeng Lin / Jaroslav Ramik

8:00AM **F-16071** **Design of Fuzzy Probabilistic Wavelet Neural Network Controller and Its Application in Power Control of Grid-Connected PV System During Grid Faults.....1725**
Faa-Jeng Lin and Kuang-Chin Lu
Department of Electrical Engineering, National Central University, Chungli, Taiwan.

8:20AM **F-16406** **A Hybrid Fuzzy-PI Cascade Controller for Transient Stability Improvement in DFIG Wind Generators.....1733**
Minh Quan Duong[1,2], Francesco Grimaccia[1], Sonia Leva[1], Marco Mussetta[1] and Kim Hung Le[2]
[1]Politecnico di Milano, Dipartimento di Energia, Via La Masa 34, 20156 Milano — Italy; [2]University of Science and Technology — The University of Da Nang, Department of Electrical Engineering, Block A, 54 Nguyen Luong Bang, LienChieu, DaNang — Vietnam.

8:40AM	**F-16563**	**A Comparison between Fuzzy and Probabilistic Estimation of Dynamic Thermal Rating of Transmission Lines.....1740** Soheila Karimi, Andrew M. Knight and Petr Musilek *Department of Electrical and Computer Engineering, University of Alberta, Edmonton, AB, Canada.*
9:00AM	**F-16100**	**Strong Consistency in Pairwise Comparisons Matrix with Fuzzy Elements on Alo-Group.....1745** Jaroslav Ramìk *Faculty of Business Administration in Karviná, Silesian University in Opava, Univerzitní nám. 76, 733 40 Karviná, Czech Republic.*
9:20AM	**F-16490**	**Weighted Voting Bodies under I-Fuzzy Settings.....1752** Elena Mielcova *Department of Informatics and Mathematics, Silesian University, School of Business Administration, Karvina, Czech Republic.*
9:40AM	**F-16417**	**Preference Comparison for Plagiarism Detection Systems.....1760** Šárka Křížková, Hana Tomášková and Martin Gavalec *Faculty of Informatics and Management, University of Hradec Králové, Rokitanského 62, Hradec Králové, 500 03 Czech Republic.*

Session HA-11	Fuzzy Man-machine Interfaces and Emotional Computing
Date/Time	Thursday, 28 July 2016 / 8:00AM – 10:00AM
Venue	Room 223
Chair	Christophe Marsala

8:00AM	**F-16481**	**Personalized Search in Smart Indoor Environments: Combining a Formal Location Model, User Preferences and Semantic Similarity.....1768** Wenyi Xu and Christophe Marsala *Sorbonne Universités, UPMC Univ Paris 06, CNRS, LIP6, UMR7606, 4 place Jussieu, 75005, Paris, France.*
8:20AM	**F-16237**	**A Fuzzy Inference Anti-Shake Technique for Mobile Display.....1776** Jyh-Da Wei, Pei-Yu Jiang and Hsu-Fu Hsiao *Department of Computer Science and Information Engineering, Chang Gung University, Taoyuan, 33302, Taiwan.*
8:40AM	**F-16451**	**Touch Interface for Guided Authoring of Expert Systems Rules.....1781** Jean-Philippe Poli and Jean-Paul Laurent *CEA, LIST, Data Analysis and System Intelligence Laboratory, 91191 Gif-sur-Yvette cedex, France.*
9:00AM	**F-16476**	**Linking Human and Machine — Towards Consumer-Driven Automated Manufacturing.....1789** Svetlin Isaev[1], Chralampos Makatsoris[1], Mohannad Jressiat[2] and Christian Wagner[3] *[1]Sustainable Manufacturing Systems Centre, School of Aerospace, Transportation and Manufacturing, Cranfield University, Bedford, UK; [2]College of Engineering, Design and Physical Sciences, Brunel University, London, UK; [3]Lab for Uncertainty in Data, And Decision Making (LUCID) & Horizon, Nottingham, UK.*

9:20AM	**F-16482**	**A Fuzzy Computational Model for Emotion Regulation Based on Affect Control Theory.....1797** Ahmad Soleimani and Ziad Kobti *School of Computer Science, University of Windsor, Windsor, ON, Canada*
9:40AM	**F-16559**	**Approach Based on Fuzzy Ontology for Situation Identification in Situation-aware Ubiquitous Learning Environment.....1805** Raoudha Souabni[1], Ines Bayoudh Saadi[2], Nesrine Ben Salah[3], Kinshuk[4] and Henda Ben Ghezala[1] *[1]RIADI Research Laboratory, National School of Computer Sciences, Manouba University, Tunisia; [2]RIADI Research Laboratory, National School of Computer Sciences, Manouba University, Tunisia and National Higher Engineering School of Tunis, Tunis University, Tunisia; [3]National Higher Engineering School of Tunis, Tunis University, Tunisia; [4]School of Computing and Information Systems, Athabasca University, Canada.*

Session	[Plenary] – Fuzzy Transfer Learning for Prediction, Prof. Jie Lu
Date/Time	Thursday, 28 July 2016 / 1:00PM – 2:00PM
Venue	Room Ballroom B
Chair	Bernadette Bouchon-Menier

Session HM-8	Fuzzy Systems for Data Summarization, Reduction, and Visualization
Date/Time	Thursday, 28 July 2016 / 2:30PM – 4:30PM
Venue	Room 220
Chair	Mihail Popescu

2:30PM	**F-26052**	**Random Projections Fuzzy K-Nearest Neighbor(RPFKNN) for Big Data Classification.....1813** Mihail Popescu[1] and James M. Keller[2] *[1]HMI Department, University of Missouri, Columbia, MO, USA; [2]ECE Department, University of Missouri, Columbia, MO, USA.*
2:50PM	**F-16142**	**Fuzzyfication of Principle Component Analysis for Data Dimensionalty Reduction.....1818** Natacha Gueorguieva[1], Iren Valova[2] and George Georgiev[3] *[1]Computer Science Department, College of Staten Island/City, University of New York, Staten Island, NY, USA; [2]Computer and Information Science, University of Massachusetts/Dartmouth, North Dartmouth, MA, USA; [3]Computer Science Department, University of Wisconsin Oshkosh, Oshkosh, WI, USA*
3:10PM	**F-16266**	**A Fuzzy Precedence Graph Definition for Algebra-Based Dimension Reduction.....1826** Ngoc Bich Dao, Sebastien Eskenazi, Karell Bertet and Arnaud Revel *Laboratory L3i, University of La Rochelle, France.*

3:30PM	**F-16286**	**Imputation of Missing Data Using Fuzzy Neighborhood Density-Based Clustering.....1834** Roozbeh Razavi-Far and Mehrdad Saif *Department of Electrical and Computer Engineering, University of Windsor, 401 Sunset Avenue, Windsor, N9B 3P4, Canada.*
3:50PM	**F-16486**	**Uncertain Training Data Set Conceptual Reduction: A Machine Learning Perspective.....1842** Eman Rezk, Syrinne Babi, Fahad Islam and Ali Jaoua *Department of Computer Science and Engineering, Qatar University, Doha, Qatar.*
4:10PM	**F-16123**	**A Soft Computing Approach to Agile Business Intelligence.....1850** Grégory Smits[1], Olivier Pivert[1] and Ronald R. Yager[2] *[1]IRISA — University of Rennes 1, UMR 6074, Lannion, France; [2]Machine Intelligence Institute — IONA College, New Rochelle, NY, USA.*

Session HM-9	SS FUZZ-IEEE-22B: Fuzzy Decision-Making: Consensus and Missing Preferences
Date/Time	Thursday, 28 July 2016 / 2:30PM – 4:30PM
Venue	Room 221
Chair	Yucheng Dong - Raquel Ureña

2:30PM	**F-16416**	**Choice Degrees in Decision-Making: A Comparison Between Intuitionistic and Fuzzy Preference Relations Approaches.....1858** Francisco Chiclana[1], Raquel Ureña[2] and Enrique Herrera-Viedma[2] *[1]Centre for Computational Intelligence (CCI), Faculty of Technology, De Montfort University, Leicester, UK; [2]Department of Computer Science and Artificial Intelligence, University of Granada, Granada, Spain.*
2:50PM	**F-16204**	**On Equivalence of Two Approaches to Group Decision Making with Interval Multiplicative Preference Relation Based on COWG Operator.....1866** Huayou Chen[1], Bing Han[1], Xi Liu[1] and Xianjun Guan[2] *[1]School of Mathematical Sciences, Anhui University, China; [2]School of Economics and Management, Tongji University, China.*
3:10PM	**F-16239**	**Robust OWA-based Aggregation for Data with Outliers.....1874** Gleb Beliakov[1], Simon James[1], Tim Wilkin[1] and Tomaso Calvo[2] *[1]School of Information Technology, Faculty of Science, Engineering and Built Environment, Deakin University, Burwood, Victoria, Australia; [2]Department of Computer Sciences, Universidad de Alcalá, Alcala de Henares, Madrid, Spain.*
3:30PM	**F-16063**	**A Consistency Improving Procedure for Fuzzy Preference Relations Based on Eigenvector Method.....1880** Yejun Xu and Huimin Wang *Business School, Hohai University, Nanjing, 211100, China.*

3:50PM **F-16180** **On Voting Consensus Modeling with Weight Constraints for Places.....1886**
Zaiwu Gong[1], Ning Zhang[2], Wei Zhao[2] and Cuiping Wei[3]
[1]Collaborative Innovation Center on Forecast and Evaluation of Meteorological Disasters, Nanjing University of Information Science and Technology, Nanjing, 210044, China; [2]Nanjing University of Information Science and Technology, Nanjing, China; [3]School of Mathematics, University of Yangzhou, Yangzhou, China.

4:10PM **F-16032** **Using Distances between Unbalanced Linguistic Assessments for Group Decision-making.....1892**
Mei Cai, Xiaobing Yu and Zaiwu Gong
School of Economics and Management, Nanjing University of Information Science and Technology, Nanjing, 210044, China

Session HM-10	SS FUZZ-IEEE-11A: Fuzzy and Intelligent Control Systems
Date/Time	Thursday, 28 July 2016 / 2:30PM – 4:30PM
Venue	Room 222
Chair	Ching-Chih Tsai

2:30PM **F-16115** **Distributed Sliding-Mode Formation Control Using Recurrent Interval Type 2 Fuzzy Neural Networks for Uncertain Multi-Ballbots.....1899**
Ching-Chih Tsai and Feng-Chun Tai
Department of Electrical Engineering, National Chung- Hsing University, Taichung, 40277, Taiwan R.O.C.

2:50PM **F-16038** **Navigation for Two Fuzzy Controlled Cooperative Object-Carrying Robots in Concave Maps with the Consideration of Dead-Cycle Problem.....1905**
Min-Ge Lai, Wan-Ting Zeng and Chia-Feng Juang
Department of Electrical Engineering, National Chung-Hsing University, Taichung, Taiwan, R.O.C.

3:10PM **F-16050** **Observer Design for Uncertain T-S Fuzzy System with Multiple Output Matrices and Unmeasurable Premise Variables.....1910**
Van-Phong Vu[1], Wen-June Wang[1] and Pei-Jun Lee[2]
[1]Department of Electrical Engineering, National Central University, Jhongli, 32001, Taiwan; [2]Department of Electrical Engineering, National Chi Nan University, Nantou 545, Taiwan.

3:30PM **F-16064** **Improved Radial Basis Function Network for the Heteroscedasticity Noises.....1918**
Yue-Shiang Liu[1], Shun-Feng Su[1], Ming-Chang Chen[1] and Jin-Tsong Jeng[2]
[1]Department of Electrical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan; [2]Department of Computer Science and Information Engineering, National Formosa University, Yunlin County, Taiwan.

3:50PM **F-16121** **Adaboost-like Method for Inverse Reinforcement Learning.....1922**
Kao-Shing Hwang, Hsuan-yi Chiang and Wei-Cheng Jiang
Department of Electrical Engineering, National Sun Yat-sen University, aohsiung, Taiwan.

4:10PM	**F-16392**	**Time Delay Compensation for Positive Nonlinear Networked Control Systems with Bounded Controls.....1926** Ling Huang[1], Cheng-Chew Lim[2] and Ji Liu[3] *[1]School of Automation, Harbin University of Science and Technology, Heilongjiang, 150080, China; [2]School of Electrical and Electronic Engineering, the University of Adelaide, SA, 5005, Australia; [3]School of Electrical and Electronic Engineering, Harbin University of Science and Technology, Harbin, 150080, China*

Session HM-11	Fuzzy and Rough Data Analysis
Date/Time	Thursday, 28 July 2016 / 2:30PM – 4:30PM
Venue	Room 223
Chair	Neil Mac Parthalain

2:30PM	**F-16370**	**Dataset Condensation Using OWA Fuzzy-Rough Setbased Nearest Neighbor Classifier.....1934** Mehran Amiri[1], Richard Jensen[2], Mahdi Eftekhari[3] and Neil Mac Parthaláin[2] *[1]Department Computer Engineering, Islamic Azad University, Kerman, Iran; [2]Department Computer Science, Aberystwyth University, Ceredigion SY23 3DB, Wales, UK; [3]Department Computer Engineering. Bahonar University Kerman, Iran.*
2:50PM	**F-16164**	**Invasive Weed Optimisation Inspired Fuzzy-rough Feature Selection.....1942** Qian Guo, Yanpeng Qu and Ansheng Deng *Information Technology College, Dalian Maritime University, Dalian, 116026, P.R. China.*
3:10PM	**F-16236**	**Semi-supervised Based Rough Set to Handle Missing Decision Data.....1948** Thinh Cao[1], Koichi Yamada[1], Muneyuki Unehara[1], Izumi Suzuki[1] and Do Van Nguyen[2] *[1]Department of Management of Information Systems, Nagaoka University of Technology, Nagaoka, Japan; [2]Institute of Information Technology, Ha Noi, Vietnam.*
3:30PM	**F-16300**	**Computing Attractors of Multi-Valued Gene Regulatory Networks Using Fuzzy Answer Set Programming.....1955** Mushthofa Mushthofa[1,2,5], Steven Schockaert[3] and Martine De Cock[1,4] *[1]Department of Applied Mathematics, Statistics and Informatics, Ghent University, Ghent, Belgium; [2]Department of Computer Science, Bogor Agricultural University, Bogor, Indonesia; [3]School of Computer Science & Informatics, Cardiff University, UK; [4]Institute of Technology, University of Washington Tacoma, USA; [5]Bioinformatics Institute Ghent, Ghent University, 9052 Ghent, Belgium*
3:50PM	**F-16580**	**A Comparison Technique for Ill-known Time Intervals.....1963** Christophe Billiet, Antoon Bronselaer and Guy De Tré *Department of Telecommunications, and Information Processing, Ghent University, B-9000 Ghent, Belgium.*

Session HP-8	Hybrid Fuzzy Systems
Date/Time	Thursday, 28 July 2016 / 4:30PM – 6:30PM
Venue	Room 220
Chair	Oscar Castillo

4:30PM **F-16223** **From Type-2 Fuzzy Rate-Based Neural Networks to Social Networks' Behaviors.....1970**
A. Khadangi and M. H. Fazel Zarandi
Department of Industrial Engineering, Amirkabir University of Technology, Tehran, Iran.

4:50PM **F-16466** **An Enhanced Adaptive Neural Fuzzy Tool Condition Monitoring for Turning Process.....1976**
Qun Ren[1], Krzysztof Jemielniak[2], Sofiane Achiche[3] and Pascal Bigras[1]
[1]Department of Automatic Manufacturing Engineering, École de technologie supérieure, University of Quebec, Montreal, QC, Canada; [2]Faculty of Production Engineering, Warsaw University of Technology, Warsaw, Poland; [3]Department of Mechanical Engineering, École, Polytechnique de Montréal, University of Montreal, Montreal, QC, Canada.

5:10PM **F-16542** **DMQEA-FCM: An Approach for Preference-based Decision Support.....1983**
Seung-Hwan Baek[1], Si-Jeong Ryu[2] and Jong-Hwan Kim[2]
[1]Robotics Program, KAIST, Daejeon, 305-701, Korea; [2]Department of Electrical Engineering, KAIST, Daejeon, 305-701, Korea.

5:30PM **F-16145** **MCMI-ANFIS: A Robust Multi Class Multiple Instance Adaptive Neuro-Fuzzy Inference System.....1991**
Amine B. Khalifa and Hichem Frigui
Multimedia Research Lab, CECS Department, University of Louisville, Louisville, KY 40292, USA.

Session HP-9	SS FUZZ-IEEE-22C: Fuzzy Decision-Making: Consensus and Missing Preferences / SS FUZZ-IEEE-25: Complex Fuzzy Sets and Logic
Date/Time	Thursday, 28 July 2016 / 4:30PM – 6:30PM
Venue	Room 221
Chair(s)	Yucheng Dong - Raquel Ureña / Scott Dick

4:30PM **F-16575** **On a Fairness Type Approach to Consensus Reaching Support Under Fuzziness via Linguistic Summaries.....1999**
Janusz Kacprzyk and Sławomir Zadrożny
Systems Research Institute, Polish Academy of Sciences, 01–447 Warsaw, Poland

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4:50PM	**F-16235**	**ANCFIS-ELM: A Machine Learning Algorithm Based on Complex Fuzzy Sets.....2007** Omolbanin Yazdanbakhsh and Scott Dick *Department of Electrical and Computer Engineering, University of Alberta, Edmonton, Alberta, Canada.*
5:10PM	**F-16421**	**Interval-Valued Complex Fuzzy Logic.....2014** Sarah Greenfield[1], Francisco Chiclana[2] and Scott Dick[3] *[1]Centre for Computational Intelligence and DMU Interdisciplinary Group in Intelligent Transport Systems (DIGITS), School of Computer Scienceand Informatics, De Montfort University, Leicester LE1 9BH, UK; [2]Centre for Computational Intelligence, School of Computer Science and Informatics, De Montfort University, Leicester LE1 9BH, UK; [3]Department of Electrical and Computer Engineering, University of Alberta, Edmonton, Alberta, Canada.*
5:30PM	**F-16218**	**A Conceptual Model for Clustering Local Government Areas Using Complex Fuzzy Sets.....2020** Jun Ma, Jie Yang, Rohan Wickramasuriya Denagamage and Murad Safadi *SMART Infrastructure Facility, Faculty of Engineering and Information Sciences, University of Wollongong, Northfields Ave, Wollongong, NSW, 2522, Australia.*
5:50PM	**F-16551**	**Complex Intuitionistic Fuzzy Classes.....2027** Mumtaz Ali[1], Dan E. Tamir[2], Naphtali D. Rishe[3] and Abraham Kandel[3] *[1]Department of Mathematics, Quaid-i-azam University, Islamabad, Pakistan; [2]Department of Computer Science, Texas State University, San Marcos, Texas, USA; [3]School of Computing and Information Sciences, Florida International University, Miami, Florida, USA.*

Session HP-10	SS FUZZ-IEEE-11B: Fuzzy and Intelligent Control Systems / SS FUZZ-IEEE-10: Type-2 Fuzzy Sets and Systems Applications (T2-A)
Date/Time	Thursday, 28 July 2016 / 4:30PM – 6:30PM
Venue	Room 222
Chair	Ching-Chih Tsai / Christian Wagner

4:30PM	**F-16589**	**Coordination of Large-Scale Systems Using Fuzzy Optimal Control Strategies and Neural Networks.....2035** Nasser Sadati[1] and Hamid Berenji[2] *[1]Intelligent Systems Laboratory, Electrical Engineering Department, Sharif University of Technology, Tehran, Iran; [2]Intelligent Inference Systems Corp., NASA Ames Research Center, Moffett Field, Cal., USA.*
4:50PM	**F-16422**	**Contrasting Singleton Type-1 and Interval Type-2 Non-Singleton Type-1 Fuzzy Logic Systems.....2043** Jabran Hussain, Christian Wagner, Amir Pourabdollah and Jonathan M. Garibaldi *Lab for Uncertainty in Data and Decision Making(LUCID), School of Computer Science, University of Nottingham, Nottingham, UK.*

5:10PM **F-16151** **A Many-Objective Genetic Type-2 Fuzzy Logic System for the Optimal Allocation of Mobile Field Engineers.....2051**
Andrew Starkey[1], Hani Hagras[1], Sid Shakya[2] and Gilbert Owusu[2]
[1]The Computational Intelligence Centre, School of Computer Science and Electronic Engineering, University of Essex, Colchester, UK; [2]Business Modelling and Operational Transformation Practice, British Telecom, Adastral Park, Ipswich, UK

5:30PM **F-16293** **A Big-Bang Big-Crunch Type-2 Fuzzy Logic Based System for Soccer Video Scene Classification.....2059**
Wei Song and Hani Hagras
The Computational Intelligence Centre, School of Computer Science and Electronic Engineering, University of Essex Colchester, UK.

5:50PM **F-16380** **Optimization with Genetic Algorithm and Particle Swarm Optimization of Type-2 Fuzzy Integrator for Ensemble Neural Network in Time Series.....2067**
Fernando Gaxiola[1], Patricia Melin[1], Fevrier Valdez[1] and Juan R. Castro[2]
[1]Tijuana Institute of Technology, Tijuana, Mexico; [2]UABC University, Tijuana, Mexico.

Session HP-11	Fuzzy TOPSIS Method
Date/Time	Thursday, 28 July 2016 / 4:30PM – 6:30PM
Venue	Room 223
Chair	Luiz Cesar Ribeiro Carpinetti

4:30PM **F-16149** **Evaluating Supply Chain Performance Based on SCOR Model and Fuzzy-TOPSIS.....2075**
Francisco Rodrigues Lima Junior[1] and Luiz Cesar Ribeiro Carpinetti[2]
[1]Department of Production Engineering, University Center of Educational Foundation Guaxupé, (UNIFEG), Guaxupé-MG, Brazil; [2]Department of Production Engineering, School of Engineering of São Carlos, University of São, Paulo (USP), São Carlos-SP, Brazil.

4:50PM **F-16101** **Fuzzy Systems with Multiple Rule Bases for Selection of Alternatives Using TOPSIS.....2083**
Abdul Malek Yaakob[1], Alexander Gegov[1], Mohamed Bader-El-Den[2] and Siti Fatimah Abdul Rahman[3]
[1]School of Quantitative Sciences, Universiti Utara Malaysia, 06010 Sintok Kedah, Malaysia; [2]School of Computing, University of Portsmouth, Portsmouth, PO1 3HE, United Kingdom; [3]Department of Mathematics, Universiti Teknologi MARA, 02600 Arau, Perlis, Malaysia.

5:10PM **F-16178** **Refining the Skyline with Fuzzy Similariy Measures and Topsis Method for the Optimization of Web Services Composition.....2091**
Fatma Rhimi[1,2], Saloua Ben Yahia[3] and Samir Ben Ahmed[3]
[1]University of Carthage, INSAT, LISI Laboratory, Tunisia; [2]ESPRIT, School of Engineering, Tunis, Tunisia; [3]University of Carthage, INSAT, LISI Laboratory, Tunisia.

5:30PM	**F-16303**	**An Exploration of Issues and Limitations in Current Methods of TOPSIS and Fuzzy TOPSIS.....2098** Elissa Nadia Madi, Jonathan M. Garibaldi and Christian Wagner *Lab for Uncertainty in Data and Decision Making (LUCID) and IMA Research Group, School of Computer Science, University of Nottingham, UK*
5:50PM	**F-16579**	**A Correlation Based Intuitionistic Fuzzy TOPSIS Method on Supplier Selection Problem.....2106** Rinki Solanki, Gabriel Gulati, Ashutosh Tiwari and Q. M. Danish Lohani *Department of Mathematics, South Asian University, New Delhi, 110021, India.*

Session FA-8	Fuzzy Data Mining and Forecasting
Date/Time	Friday, 29 July 2016 / 8:00AM – 10:00AM
Venue	Room 220
Chair	Antonio González

8:00AM	**F-16033**	**Fast Algorithms for Mining Multiple Fuzzy Frequent Itemsets.....2113** Jerry Chun-Wei Lin[1], Ting Li[1], Philippe Fournier-Viger[2], Tzung-Pei Hong[2,4] and Ja-Hwung Su[5,6] *[1]School of Computer Science and Technology, Harbin Institute of Technology Shenzhen Graduate School, Shenzhen, China; [2]School of Natural Sciences and Humanities, Harbin Institute of Technology Shenzhen Graduate School, Shenzhen, China; [3]Department of Computer Science and Information Engineering, National University of Kaohsiung, Kaohsiung, Taiwan; [4]Department of Computer Science and Engineering, National Sun Yat-sen University, Kaohsiung, Taiwan; [5]Department of Information Management, Cheng Shiu University, Kaohsiung, Taiwan; [6]Department of Information Management, Kainan University, Taoyuan, Taiwan.*
8:20AM	**F-16225**	**AutoMFIS: Fuzzy Inference System for Multivariate Time Series Forecasting.....2120** Julio Ribeiro Coutinho, Ricardo Tanscheit, Marley Vellasco and Adriano Koshiyama *Department of Electrical Engineering, Pontifical Catholic University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil.*
8:40AM	**F-16234**	**A Geometric Approach for Mining Sequential Patterns in Interval-Based Data Streams.....2128** Marwan Hassani[1], Yifeng Lu[1], Jens Wischnewsky[1] and Thomas Seidl[2] *[1]Data Management and Data Exploration Group, RWTH Aachen University, Germany; [2]Database Systems Group, LMU Munich, Germany.*
9:00AM	**F-16495**	**Analysis of Probabilistic Fuzzy Systems' Parameters in Conditional Density Estimation.....2136** Rui Jorge Almeida[1], Nalan Baştürk[2], Uzay Kaymak[1] and João M. C. Sousa[3] *[1]School of Industrial Engineering, Eindhoven University of Technology; [2]Department of Quantitative Economics, Maastricht University, The Netherlands; [3]Instituto Superior Técnico, Universidade de Lisboa, Portugal*

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9:20PM **F-16603** **Predicting ICU Readmissions Based on Bedside Medical Text Notes.....2522**
Sérgio Curto[1], Joao P. Carvalho[1], Cátia Salgado[2], Susana M. Vieira[2], João M. C. Sousa[2]
[1]INESC-ID, Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal; [2]LAETA, IDMEC, Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal.

Session FA-9	SS FUZZ-IEEE-20B: Intelligent Medical Science
Date/Time	Friday, 29 July 2016 / 8:00AM – 10:00AM
Venue	Room 221
Chair	Syoji Kobashi

8:00AM **F-16530** **Blumensaat's Line Detection for Quadrant Method on MR Images.....2144**
Kento Morita, Syoji Kobashi, Kaori Kashiwa, Hiroshi Nakayama, Shunichiro Kambara, Masakazu Morimoto, Shinichi Yoshiya and Satoru Aikawa
[1]Graduate School of Engineering, University of Hyogo, Hyogo, Japan; [2]WPI IFReC, Osaka University of Hyogo, Osaka, Japan; [3]Hyogo College of Medicine, Hyogo, Japan

8:20AM **F-16424** **A Study on Feature Extraction and Disease Stage Classification for Glioma Pathology Images.....2150**
Kiichi Fukuma[1,2], V. B. Surya Prasath[3], Hiroharu Kawanaka[1], Bruce J. Aronow[4,5] and Haruhiko Takase[1]
[1]Graduate School of Engineering, Mie University, 1577 Kurima-machiya, Tsu, Mie 514-8507, Japan; [2]Computational Imaging and VisAnalysis (CIVA) Lab, Department of Computer Science, University of Missouri-Columbia, MO, 65211, USA; [3]Division of Biomedical Informatics, Cincinnati Children's Hospital Medical Center, Cincinnati, OH, 45229, USA; [4]Department of Pediatrics, University of Cincinnati, OH, USA

8:40AM **F-16216** **Exploring Differences in Interpretation of Words Essential in Medical Expert-Patient Communication.....2157**
J. Navarro[1], C. Wagner[1], U. Aickelin[2], L. Green[3] and R. Ashford[3]
[1]Lab for Uncertainty in Data and Decision Making (LUCID) and Horizon, School of Computer Science, University of Nottingham, UK; [2]The University of Nottingham Ningbo; [3]Nottingham University Hospitals, UK.

9:00AM **F-16284** **Nursing-care Text Evaluation Using Word Vector Representations Realized by word2vec.....2165**
Manabu Nii[1,3], Yuya Tuchida[2], Takuya Iwamoto[1], Atsuko Uchinuno[3,4] and Reiko Sakashita[3,4]
[1]Graduate School of Engineering, University of Hyogo, Himeji, Hyogo, Japan; [2]School of Engineering, University of Hyogo, Himeji, Hyogo, Japan; [3]Japan Institute for Nursing Quality Improvement (JINQI), Akashi, Hyogo, Japan; [4]College of Nursing Art and Science, University of Hyogo, Akashi, Hyogo, Japan

9:20AM **F-16501** **Bayesian CP Factorization of Incomplete Tensor for EEG Signal Application.....2170**
Gaochao Cui[1,2], Lihua Gui[1], Qibin Zhao[2], Andrzej Cichocki[2] and Jianting Cao[1,2]
[1]Graduate School of Engineering, Saitama Institute of Technology, 1690 Fusaiji, Fukaya-shi, Saitama, 369-0293, Japan; [2]Brain Science Institute, RIKEN, Wako-shi, Saitama, Japan.

9:40AM **F-16587** **Highly Enhanced Context Respectful Counseling Agent.....2174**
Tetsuo Shinozaki[1], Yukiko Yamamoto[1], Setsuo Tsuruta[1], Ernesto Damiani[2] and Rainer Knauf[3]
[1]School of Information Environment, Tokyo Denki University, Inzai, Japan; [2]Department of Computer Science, The University of Milan, Milan, Italy; [3]Ilmenau University of Technology, Ilmenau, Germany.

Session FA-10	FUZZ-IEEE-29A: Recent Advances in Fuzzy Control System Design and Analysis
Date/Time	Friday, 29 July 2016 / 8:00AM – 10:00AM
Venue	Room 222
Chair	Zsofia Lendek - Jun Yoneyama

8:00AM **F-16292** **Local Quadratic and Nonquadratic Stabilization of Discrete-time TS Fuzzy Systems.....2182**
Zsófia Lendek[1] and Jimmy Lauber[2]
[1]Department of Automation, Technical University of Cluj-Napoca, Memorandumului 28, 400114 Cluj-Napoca, Romania; [2]University of Valenciennes and Hainaut-Cambresis, LAMIH UMR CNRS 8201, Le Mont Houy, 59313 Valenciennes Cedex 9, France.

8:20AM **F-16561** **Output Feedback Stabilization of Discrete-Time Fuzzy Systems.....2188**
Fumihiro Sano, Kenta Hoshino and Jun Yoneyama
Department of Electrical Engineering and Electronics, Aoyama Gakuin University, 5-20-1 Fuchinobe, Chuo-ku, Sagamihara, 252-5258, Japan.

8:40AM **F-16562** **A Novel Non-Fragile Output Feedback Controller Design for Uncertain Takagi-Sugeno Fuzzy Systems.....2193**
Jun Yoneyama and Kenta Hoshino
Department of Electrical Engineering and Electronics, Aoyama Gakuin University, 5-20-1 Fuchinobe, Chuo-ku, Sagamihara, 252-5258, Japan.

9:00AM **F-16092** **Novel Membership-function-dependent Stability Condition for T-S Fuzzy Systems.....2199**
Xiaozhan Yang[2], Hak-Keung[2] Lam and Ligang Wu[2]
[1]Department of Informatics, King's College London, London, WC2R 2LS, United Kingdom; [2]Research Institute of Intelligent Control and Systems, Harbin Institute of Technology, Harbin, 150001, China.

9:20AM **F-16277** **Replica of an Advanced Takagi-Sugeno Discrete Observer without Matrix Inversion.....2206**
Thomas Laurain[1], Jimmy Lauber[1] and Reinaldo Martinez Palhares[2]
[1]Automatic Control and Human-Machine Systems, LAMIH UMR/CNRS 8201, Valenciennes, France; [2]Department of Electronics Engineering, Federal University of Minas Gerais, Belo Horizonte, Brazil.

9:40AM **F-16323** **Smoothing Switched Control for Uncertain T-S Fuzzy Systems with Unknown Membership Functions, Actuator Saturation and Disturbance.....2212**
Uiliam Nelson L. T. Alves[1], Diogo R. de Oliveira[1], Marcelo C. M. Teixeira[2], Rodrigo Cardim[2] and Edvaldo Assunção[2]
[1]Control Research Laboratory, UNESP — Univ Estadual Paulista, Carlos Rossi Avenue, n°1370, 15.385-000, Ilha Solteira — SP, Brazil; [2]Department of Electrical Engineering, UNESP — Univ Estadual Paulista., Carlos Rossi Avenue, n°1370, 15.385-000, Ilha Solteira — SP, Brazil.

8:00AM **F-16568** **Analogy in Recommendation. Numerical vs. Ordinal: A Discussion.....2220**
Nicolas Hug, Henri Prade, Gilles Richard and Mathieu Serrurier
Institut de Recherche en Informatique de Toulouse, CNRS, Université Paul Sabatier, France.

8:20AM **F-16173** **An Improved Multi-objective Evolutionary Optimization of Data-Mining-Based Fuzzy Decision Support Systems.....2227**
Marian B. Gorzałczany and Filip Rudziński
Department of Electrical and Computer Engineering, Kielce University of Technology, Al. 1000-lecia P.P. 7, 25-314 Kielce, Poland.

8:40AM **F-16269** **A Partner-Selection Method Based on Interval Multiplicative Preference Relations with Approximate Consistency.....2235**
Fang Liu[1,2], Li-Hua Pan[2] and Ya-Nan Peng[2]
[1]School of Management, Xi'an Jiaotong University, Xi'an, Shaanxi, 710049, P.R. China; [2]School of Mathematics and Information Science, Guangxi University, Nanning, Guangxi, 530004, P.R. China

9:00AM **F-16322** **Bayesian Decision Making Using Z-numbers.....2241**
Nina Marhamati[1], Elham S. Khorasani[2] and Shahram Rahimi[1]
[1]Department of Computer Science, Southern Illinois University, Carbondale, 62901, Illinois, USA; [2]University of Illinois, Springfield, Illinois, USA.

9:20AM **F-16430** **fGrid: Uncertainty Variables Modeling for Computational Grids Using Fuzzy Logic.....2249**
Bruno Moura, Yan Soares, Leticia Sampaio, Renata Reiser, Adenauer

Yamin and Mauricio Pilla
Universidade Federal de Pelotas, Centro de Desenvolvimento Tecnológico (CDTEC), Laboratory of Ubiquitous and Parallel Systems (LUPS), Rua Gomes Carneiro, 1 - 96010-610-Pelotas-RS-Brazil.

9:40AM **F-16435** **Online Temporal Reasoning for Event and Data Streams Processing.....2257**
Jean-Philippe Poli, Laurence Boudet and David Mercier
CEA, LIST, Data Analysis and System Intelligence Laboratory, 91191 Gif-sur-Yvette cedex, France.

Session	[Plenary] – From Fuzzy Models to Granular Modeling: 50 Years and Beyond, Prof. Witold Pedrycz
Date/Time	Friday, 29 July 2016 / 1:00PM – 2:00PM
Venue	Room Ballroom B
Chair	Naoyuki Kubota

Session FM-8	Fuzzy Systems in Emerging Areas
Date/Time	Friday, 29 July 2016 / 2:30PM – 4:30PM
Venue	Room 220
Chair	Massimo Panella

2:30PM **F-16012** **ECG Rate Control Scheme in Pervasive Health Care Monitoring System.....2265**
Sara Ghanavati, Jemal Abawajy and Davood Izadi
School of Information Technology, Deakin University, Geelong, Australia.

2:50PM **F-16045** **A Conceptual Model of Fuzzy Topological Relationships for Fuzzy Regions.....2271**
Anderson Chaves Carniel[1] and Markus Schneider[2]
[1]Department of Computer Science, University of São Paulo, São Carlos, SP 15560-970, Brazil; [2]Department of Computer & Information Science & Engineering, University of Florida, Gainesville, FL 32611, USA.

3:10PM **F-16062** **Information Conservational YinYang Bipolar Quantum-Fuzzy Cognitive Maps — Mapping Business Data to Business Intelligence.....2279**
Wen-Ran Zhang
Department of Computer Science, Georgia Southern University, Statesboro, GA, USA.

3:30PM **F-16516** **Distributed Learning of Random Weights Fuzzy Neural Networks.....2287**
Roberto Fierimonte, Marco Barbato, Antonello Rosato and Massimo Panella
Department of Information Engineering, Electronics and Telecommunications (DIET), University of Rome "La Sapienza", Via Eudossiana 18, 00184 Rome, Italy.

3:50PM **F-16588** **Atanassov Intuitionistic Fuzzy Domain Adaptation to Contain Negative Transfer Learning.....2295**
Sandeep Kumar, Amit K. Shukla, Pranab K. Muhuri and Q. M. Danish Lohani
Faculty of Mathematics and Computer Science, South Asian University, Akbar Bhavan, Chanakyapuri, New Delhi-110021, India.

Session FM-9	SS FUZZ-IEEE-32: Fuzzy Pattern Recognition for Big Data Modeling and Data Mining
Date/Time	Friday, 29 July 2016 / 2:30PM – 4:30PM
Venue	Room 221
Chair	Mohammad H. Fazel Zarandi

2:30PM **F-16083** **Lung Tumor Area Recognition in CT Images Based on Gustafson-Kessel ClusteRING.....2302**
Parnian Afshar, Abbas Ahmadi and M. H. Fazel Zarandi
Department of Industrial Engineering and Management Systems, Amirkabir University of Technology, Tehran, Iran.

2:50PM **F-16252** **A New Multiple Classifier System for Diagnosis of Erythemato-Squamous Diseases Based on Rough Set Feature Selection.....2309**
B. Lahijanian, F. Vasheghani Farahani and M. H. Fazel Zarandi
Department of Industrial Engineering and Management Systems, Amirkabir University of Technology, Tehran, Iran.

3:10PM **F-16285** **Identifying Chaff Echoes in Weather Radar Data Using Tree-Initialized Fuzzy Rule-Based Classifier.....2317**
Jungwon Yu, Hansoo Lee, Yeongsang Jeong and Sungshin Kim
Department of Electrical and Computer Engineering, Pusan National University, Busan, Korea.

3:30PM **F-16378** **General Type-2 Fuzzy Edge Detector Applied on Face Recognition System Using Neural Networks.....2325**
Claudia I. Gonzalez, Juan R. Castro[1], Olivia Mendoza[1] and Patricia Melin[2]
[1]School of Engineering, University of Baja California, Tijuana, México; [2]Division of Graduate Studies, Tijuana Institute of Technology, Tijuana, México.

3:50PM **F-16382** **Comparison between Choquet and Sugeno Integrals as Aggregation Operators for Modular Neural Networks.....2331**
Gabriela E. Martínez[1], Olivia Mendoza[1], Patricia Melin[2] and Fernando Gaxiola[2]
[1]Faculty of Chemical Sciences and Engineering Autonomous, University of Baja California, Tijuana; [2]Division of Graduate Studies and Research, Tijuana Institute of Technology, Tijuana, México.

Session FM-10	FUZZ-IEEE-29B: Recent Advances in Fuzzy Control System Design and Analysis
Date/Time	Friday, 29 July 2016 / 2:30PM – 4:30PM
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Chair	Zsofia Lendek - Jun Yoneyama

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Fayçal Bourahala[1], Kevin Guelton[2], Farid Khaber[1] and Noureddine Manamanni[2]
[1]QUERE Laboratory, Ferhat Abbas University, 19000 Setif, Algeria; [2]CReSTIC EA3804, Université de Reims Champagne-Ardenne, Moulin de la housse BP1039, 51687 Reims cedex 2, France.

2:50PM **F-16447** **A Method to Avoid the Unmeasurable Premise Variables in Observer Design for Discrete Time TS Systems.....2343**
D. Ichalal[1], B. Marx[2], D. Maquin[2] and J. Ragot[2]
[1]IBISC-Lab, Evry-Val d'Essonne University, 40, rue de Pelvoux, 91020, Courcouronnes, France; [2]Université de Lorraine, Centre de Recherche en Automatique de Nancy, CNRS, CRAN, UMR 7039, 2 avenue de la Forêt de Haye, 54516 Vandoeuvre-lés-Nancy, France

3:10PM **F-16459** **How a Person with Spinal Cord Injury Controls a Sitting Situation — Unknown Input Observer and Delayed Feedback Control with Time-Varying Input Delay.....2349**
M. Blandeau[1], T. M. Guerra[1], P. Pudlo[1], F. Gabrielli[1] and V. Estrada-Manzo[2]
[1]LAMIH UMR CNRS 8201, Université de Valenciennes et du Hainaut-Cambrésis Le Mont Houy, 59300, Valenciennes, France; [2]Department of Electrical and Electronics Engineering, Sonora Institute of Technology, 5 de febrero 818 Sur, CP 85000, Obregón, Mexico.

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Rémi Losero[1], Jimmy Lauber[1], Thierry-Marie Guerra[1] and Pascal Maurel[2]
[1]Automatic Control and Human-Machine Systems, LAMIH UMR/CNRS 8201, Valenciennes, France; [2]Valeo Powertrain Systems, Amiens, France.

3:50PM **F-16550** **On Nonlinear Observers in Takagi-Sugeno form Based on Fixed and Variable Structure.....2364**
Horst Schulte
Department of Engineering I, Control Engineering Group, University of Applied Sciences Berlin (HTW), Berlin, Germany.

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Mozammel Chowdhury[1], Junbin Gao[2] and Rafiqul Islam[3]
[1]School of Computing & Mathematics, Charles Sturt University, Bathurst, NSW 2795, Australia; [2]Discipline of Business Analytics, University of Sydney Business School, Camperdown, NSW 2006, Australia; [3]School of Computing & Mathematics, Charles Sturt University, Albury, NSW 2640, Australia.

Session FM-11	Extended Fuzzy Decision Making Models
Date/Time	Friday, 29 July 2016 / 2:30PM – 4:30PM
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2:30PM **F-16191** **Fuzzy Automaton Model with Adaptive Inference Mechanism for Intelligent Decision Support Systems.....2377**
Janos L. Grantner[1], Sean T. Fuller[1] and Jozsef Dombi[2]
[1]Department of Electrical and Computer Engineering, Western Michigan University, Kalamazoo, MI, USA; [2]Institute of Informatics, University of Szeged, Szeged, Hungary.

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Zbigniew Suraj[1] and Sibasis Bandyopadhyay[2]
[1]Chair of Computer Science, University of Rzeszów, Poland; [2]Department of Mathematics, Visva Bharati, Santiniketan, India.

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School of Electrical Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, 34141, Korea.

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Chair	Nouredine Tamani

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Guy De Tré[1], Christophe Billiet[1], Antoon Bronselaer[1] and Carlos D. Barranco[2]
[1]Ghent University, Dept. of Telecommunications and Information Processing, Sint-Pietersnieuwstraat 41, B9000, Ghent, Belgium; [2]Pablo de Olavide University, Division of Computer Science, School of Engineering, 41013, Seville, Spain.

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Olivier Pivert, Olfa Slama and Virginie Thion
Rennes 1 University / IRISA Lannion, France.

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Souheyl Mallat[1], Emna Hkiri[1], Mohsen Maraoui[2] and Mounir Zrigui[1]
[1]LATICE Laboratory Research Department of Computer Science, Faculty of Sciences, University of Monastir, Monastir, Tunisia; [2]Computational Mathematics Laboratory, Faculty of Sciences, University of Monastir, Monastir, Tunisia.

5:30PM **F-16474** **Towards a User Privacy Preservation System for IoT Environments: a Habit-Based Approach.....2425**
Nouredine Tamani and Yacine Ghamri-Doudane
L3i Lab, Univ. La Rochelle, France.

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Chair	Florentin Smarandache

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Mumtaz Ali[1], Florentin Smarandache[2] and Jian-qiang Wang[3]
[1]Department of Mathematics, Quaid-i-azam University, Islamabad 45320, Pakistan; [2]Mathematics and Science Department, University of New Mexico, 705 Gurley Ave., Gallup, New Mexico 87301, USA; [3]School of Business, Central South University, 410083, Changsha, China.

4:50PM **F-16013** **R-intersections and R-unions of Neutrosophic Cubic Sets.....2441**
Young Bae Jun[1], Florentin Smarandache[2] and Chang Su Kim[1]
[1]Department of Mathematics Education, Gyeongsang National University, Jinju 52828, Korea; [2]Mathematics & Science Department, University of New Mexico, 705 Gurley Ave., Gallup, NM 87301, USA.

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[1]Laboratory of Information processing, Faculty of Science, Ben M'Sik, University Hassan, II, B.P 7955, Sidi Othman, Casablanca, Morocco; [2]Department of Mathematics, University of New, Mexico, 705 Gurley Avenue, Gallup, NM 87301, USA; [3]Ecole Royale Navale, Boulevard Sour Jdid, B.P 16303, Casablanca, Morocco.

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[1]Neutrosophic Science International Association, New Mexico, USA; [2]Faculty of Computer Science, "Alexandru Ioan Cuza", University of Iaşi, Iaşi, Romania; [3]University of New Mexico, Gallup, NM 87301, USA

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[1]Muallim Rıfat Faculty of Education, Kilis 7 Aralık University, 79000, Kilis, Turkey; [2]University of New Mexico, 705 Gurley Ave., Gallup, New Mexico 87301, USA; [3]Department of Mathematics, Quaid-i-Azam University, Islamabad, Pakistan.

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Azeddine Elhassouny[1] and Florentin Smarandache[2]
[1]Team RIITM, Department Engineering Software, ENSIAS, MOHAMMED V UNIVERSITY IN RABAT, Rabat, Morocco; [2]Department Mathematics, University of New Mexico, Gallup, New Mexico, USA.

Session FP-11	Fuzzy Brain-computer Interfaces and Fuzzy Hardware
Date/Time	Friday, 29 July 2016 / 4:30PM – 6:30PM
Venue	Room 223
Chair	Azeem Mohammad Fazle

4:30PM **F-16098** **Design of an Analog Current Mode CMOS Based Programmable Interval Type-2 Fuzzy Inference System.....2481**

Mohammad Fazle Azeem[1] and K. P. Abdulla[2]

[1]Department of Electrical Engineering (EED), Zakir Husain College of Engineering and Technology (ZHCET), Aligarh, Uttar Pradesh, India; [2]School of Engineering & IT, Manipal University, Dubai Campus, Academic City, Dubai, UAE.

4:50PM **F-16228** **Driving Fatigue Prediction with Pre-Event Electroencephalography (EEG) via a Recurrent Fuzzy Neural Network.....2488**

Yu-Ting Liu[1,2], Shang-Lin Wu[1,2], Kuang-Pen Chou[3], Yang-Yin Lin[2,5], Jie Lu[6], Guangquan Zhang[6], Wen-Chieh Lin[4] and Chin-Teng Lin[1,2,6]

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5:10PM **F-16328** **A Motor Imagery Based Brain-Computer Interface System via Swarm-Optimized Fuzzy Integral and Its Application.....2495**

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5:30PM **F-16553** **Meta-cognitive Interval Type-2 Fuzzy Controller for Quadcopter Flight Control — An EEG Based Approach.....2501**

A. K. Das, Tan Teck Leong, S. Suresh and N. Sundararajan

School of Computer Engineering, Nanyang Technological University, 639798, Singapore

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6:10PM **F-16147** **Hybrid Dynamic Fuzzy Cognitive Maps and Hierarchical Fuzzy Logic controllers for Autonomous Mobile Navigation.....2516**
Márcio Mendonça[1], Esdras S. da Silva[1], Ivan Rossato Chrun[2] and Lúcia Valéria R. Arruda[2]
[1]DAELE (Electric Department), UTFPR-CP, Cornélio Procópio, Brazil; [2]CPGEI (Graduate School on Electrical and Computer Engineering), UTFPR-CT, Curitiba, Brazil.

Additional Paper: **n-Valued Refined Neutrosophic Soft Set Theory.....2475**
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