

# **2012 International Conference on Fuzzy Theory and Its Applications**

**(iFUZZY 2012)**

**Taichung, Taiwan  
16-18 November 2012**



**IEEE Catalog Number: CFP1222T-PRT  
ISBN: 978-1-4673-2057-3**

# TABLE OF CONTENTS

<b>Adaptive Fuzzy Backstepping Decentralized Control for Nonlinear Large-Scale Systems Based on DSC Technique and High-Gain Filters</b> .....	6
<i>Yongming Li, Shaocheng Tong, Tieshan Li</i>	
<b>T-S Fuzzy Control for a Class of Networked Control System</b> .....	12
<i>Ti-Hung Chen, Chung-Chun Kung, Chi-Jheng Lin</i>	
<b>Robust Fuzzy Control for Inverted Pendulum with Model Uncertainty and Output Constraint via LMI Stability Analysis</b> .....	18
<i>Gwo-Ruey Yu, Shun-Min Wang</i>	
<b>Improvement Tourism Competitiveness using Hybrid Fuzzy MCDM</b> .....	24
<i>Kua-Hsin Peng, Gwo-Hshiung Tzeng</i>	
<b>Improving Cloud Computing Service in Fuzzy Environment - Combining Fuzzy DANP and Fuzzy VIKOR with a New Hybrid FMCDM Model</b> .....	30
<i>Chiu-Hung Su, Gwo-Hshiung Tzeng, Hao-Lin Tseng</i>	
<b>The Fuzzy DNP Based TAM3 for Analyzing the Factors Influencing the Acceptance of PadFones</b> .....	36
<i>Chi-Yo Huang, Yu-Sheng Kao</i>	
<b>Derivations of Factors Influencing the Word-of-Mouth Marketing Strategies for Smart Phone Applications by Using the Fuzzy DEMATEL Based Network Process</b> .....	42
<i>Chi-Yo Huang, Yen-Hsiang Ting</i>	
<b>Measuring Consumer Loyalty of B2C e-Retailing Service by : a FANP-Based Synthetic Model</b> .....	48
<i>Yuching Chern, Gwo-Hshiung Tzeng</i>	
<b>Social Behavior Algorithm</b> .....	57
<i>Wei-Zhan Hung</i>	
<b>Comparison of Ant-inspired Search Techniques for Software Release Planning</b> .....	62
<i>Chuan-Wen Chiang, Yu-Qing Huang</i>	
<b>A Heuristic Approach to Red Crescent Aid Depots Location Problem</b> .....	68
<i>Kubilay Ecerkale</i>	
<b>Using Fuzzy Logic and Particle Swarm Optimization to Design an Image Filter</b> .....	72
<i>Hung-Hsu Tsai, Bae-Muu Chang, Ji-Shiang Shih</i>	
<b>A Color-theory-based Geographical Energy Efficient Routing Algo-rithm for Wireless Sensor Networks</b> .....	78
<i>Young-Long Chen, Wei-Hsiang Huang, Li-Hsien Chang</i>	
<b>Linguistic Reasoning based on Generalized Modus Ponens with Linguistic Modifiers and Hedge Moving Rules</b> .....	82
<i>Le Anh Phuong, Tran Dinh Khang</i>	
<b>Hybrid Clonal Selection Algorithm and the Artificial Bee Colony Algorithm for a Variable PID-like Fuzzy Controller Design</b> .....	87
<i>Jia-Ping Tien, Tzuu-Hseng S. Li</i>	
<b>Model Reference Fuzzy Tracking Control Design for Uncertain Singularly Perturbed Nonlinear Systems</b> .....	95
<i>Kuo-Jung Lin</i>	
<b>Fuzzy-Neural Adaptive Iterative Learning Control for a Class of Nonlinear Discrete-Time Systems</b> .....	101
<i>Ying-Chung Wang, Chiang-Ju Chien</i>	
<b>Intelligent Fuzzy Motion Control of Three-Wheeled Omnidirectional Mobile Robots for Trajectory Tracking and Stabilization</b> .....	107
<i>Hsu-Chih Huang, Ter-Feng Wu, Chun-Hao Yu, Huan-Shiuan Hsu</i>	
<b>A Fuzzy Set Extension of DRSA on the Better Life in Happiness</b> .....	113
<i>Yu-Chien Ko, Yu-Chien Chen, Yao-Yi Huang, Gwo-Hshiung Tzeng</i>	
<b>A Comparison of Fuzzy DNP and SEM in A Comparison of Fuzzy DNP and SEM in A Comparison of Fuzzy DNP and SEM in Analyzing Novel Mobile Learning Technology Acceptances by Learners</b> .....	119
<i>Chi-Yo Huang</i>	
<b>The Non-additive Choquet Integration in the Fuzzy DNP Framework for Evaluating Co-dependent Technology Transfer Models</b> .....	125
<i>Chi-Yo Huang</i>	
<b>The Fuzzy DEMATEL Based Impact Derivations for Integrated Market- ing Communications on the High-Technology Brands</b> .....	131
<i>Chi-Yo Huang, Cheng-Wei Liu, Gwo-Hshiung Tzeng</i>	

<b>A Fuzzy Risk Attitude Classification Based on Prospect Theory .....</b>	<b>137</b>
<i>Yang Li, Edy Portmann</i>	
<b>Study on Fuzzy Safety Risk Evaluation Method of Airport Industry with Influence Factor Analysis .....</b>	<b>144</b>
<i>Xian-Feng Lu, Sheng-Guo Huang</i>	
<b>Differential Protection Schemes for Classification of Fault Detection between External Fault and Internal Winding Fault in Transformer using Probabilistic Neural Network .....</b>	<b>150</b>
<i>C. Jettanasen, J. Klomjit, C. Positharn, S. Bunjongjit, A. Ngaopitakkul</i>	
<b>Discrete Wavelet Transform and Probabilistic Neural Network Algorithm for Fault Location in Underground Cable.....</b>	<b>154</b>
<i>C. Apisit, C. Positharn, A. Ngaopitakkul</i>	
<b>Fault Diagnosis of Electric Power System Transformer on CMAC Neural Network Approach .....</b>	<b>158</b>
<i>Neng-Sheng Pai, Yi-Chung Lai</i>	
<b>Cascaded Fuzzy-PID Control Using PSO-EP Algorithm for Air Source Heat Pumps .....</b>	<b>163</b>
<i>Ching-Chih Tsai, Kuei-I Tsai, Chen-Tai Su</i>	
<b>Intelligent Backstepping Sliding-Mode Control Using Recurrent Interval Type 2 Fuzzy Neural Networks for a Ball-Riding Robot.....</b>	<b>169</b>
<i>Cheng-Kai Chan, Ching-Chih Tsai</i>	
<b>A Sum-of-Squares Approach to Synchronization of Chaotic Systems with Polynomial Fuzzy Systems .....</b>	<b>175</b>
<i>Gwo-Ruey Yu, Hsiang-Ting Huang</i>	
<b>Self-Tuning Predictive PID Controller Using Wavelet Type-2 Fuzzy Neural Networks .....</b>	<b>181</b>
<i>Chi-Huang Lu, Chi-Ming Liu, Chin-Chi Cheng, Jheng-Yu Guo</i>	
<b>Continuous Ant Optimized Type-2 Fuzzy Controller for Accurate Mobile Robot Wall-Following Control.....</b>	<b>187</b>
<i>Chia-Hung Hsu, Chia-Feng Juang</i>	
<b>A Fuzzy Inference Model for Removing the Color Cast of Digitally Captured Images under Unknown Illuminants.....</b>	<b>192</b>
<i>Ho-Chia Hung, Cheng-Lun Chen</i>	
<b>Backing-Up Control of a Truck Using Neural Fuzzy Systems with Culture-Based Cooperative Differential Evolution.....</b>	<b>198</b>
<i>Cheng-Hung Chen, Sheng-Yen Yang</i>	
<b>Fuzzy Bacterial Foraging System and its Applications in Control of Servo Motors.....</b>	<b>203</b>
<i>Yu-Sheng Lin, Yih-Guang Leu, Wei-Cheng Lu</i>	
<b>Velocity Observer-based Fuzzy Adaptive Control of Multi-link Robotic Manipulators .....</b>	<b>208</b>
<i>Ching-Hung Lee, Hao-Yuan Hsueh</i>	
<b>Genetic Based Feed-forward Neural Network Training for Chaff Cluster Detection .....</b>	<b>215</b>
<i>Hansoo Lee, Jungwon Yu, Yeongsang Jeong, Sungshin Kim</i>	
<b>A New Target Recognition Scheme using 24GHz Microwave RADAR .....</b>	<b>220</b>
<i>Heejin Lee, Baehoon Choi, Beomseong Kim, Euntae Kim</i>	
<b>Building an Intelligent Supporting System for Safe Navigation Using Fuzzy Theory .....</b>	<b>223</b>
<i>Gyei-Kark Park, Do-Yeon Kim</i>	
<b>Statistical Cluster Validity Indexes to Consider Cohesion and Separation .....</b>	<b>228</b>
<i>Kyung Mi Lee, Keon Myung Lee, Chan Hee Lee</i>	
<b>Intention Estimation of a Walker Around Pedestrian Lights by Using Fuzzy Rules.....</b>	<b>233</b>
<i>A-Ram Kim, Sang-Yong Rhee</i>	
<b>A Study of the Influence of Vocalization on Lip Motion for Command Input Interfaces .....</b>	<b>238</b>
<i>Tsuyoshi Takahashi, Yoichi Kageyama, Atsushi Momose, Masaki Ishii</i>	
<b>A Robust Tracking Approach for Vision-based Forward Vehicle Detection .....</b>	<b>244</b>
<i>Fu-Hsaing Chi, Chih-Li Huo, Yu-Hsaing Yu, Tsung-Ying Sun,</i>	
<b>A Video Surveillance System for People Detection and Number Estimation .....</b>	<b>249</b>
<i>Inai-Jen Li, Chun-Fu Chuang, Yu-Ting Wei, Hsiang-Chieh Chen</i>	
<b>Study on Tire Mark Regions Extraction.....</b>	<b>254</b>
<i>Xia Yu, Qiuzhen Zhang</i>	
<b>A New Reversible Data Hiding Based on Fuzzy Predictor.....</b>	<b>258</b>
<i>Shuenn-Shyang Wang, Sz-Jiun Fan, Chien-Sung Li</i>	
<b>Design of Fuzzy Control Applied to the Path Following of Lego-NXT System .....</b>	<b>263</b>
<i>Hung-Jin Chen, Yu-Hsin Kao</i>	
<b>Interval Type-2 Takagi-Sugeno Fuzzy Controller Design for a Class of Nonlinear Singular Networked Control Systems .....</b>	<b>268</b>
<i>Chwan-Lu Tseng, Shun-Yuan Wang, Shou-Chuang Lin, Yu-Yuan Chen</i>	
<b>Navigation Design with SVM Path Planning and Fuzzy-Based Path Tracking for Wheeled Agent.....</b>	<b>273</b>
<i>Kuo-Ho Su, Feng-Li Lian, Chan-Yun Yang</i>	

<b>Speed up the Execution Efficiency of Finding Fuzzy Frequent Itemsets .....</b>	<b>279</b>
<i>Tzung-Pei Hong, Yi-Hsin Lin, Guo-Cheng Lan, Shing-Tai Pan</i>	
<b>A Fuzzy Tolerating Mechanism for the Multi-Valued Neuron.....</b>	<b>283</b>
<i>Jin-Ping Chen, Shie-Jue Lee</i>	
<b>ECG Signal Analysis by Using Hidden Markov Model.....</b>	<b>288</b>
<i>Shing-Tai Pan, Tzung-Pei Hong, Hung-Chin Chen</i>	
<b>Differentiation Between Resting-State fMRI data from ADHD and Normal Subjects : Based on Functional Connectivity and Machine Learning.....</b>	<b>294</b>
<i>Sheng-Fu Liang, Tsung-Hao Hsieh, Pin-Tzu Chen, Chun-Chia Kung, Chun-Yu Lin, Fu-Zen Shaw</i>	
<b>ANFIS-based Aided Stabilization Control and Image Tracking for Mobile Robot.....</b>	<b>299</b>
<i>Kuo-Hsien Hsia, Shao-Fan Lien</i>	
<b>An Evaluation of Alternative Business Strategies: A Hybrid Fuzzy Model Approach.....</b>	<b>305</b>
<i>Catherine W. Kuo, Shun-Chiao Chang, Pei-Hsuan Tsai</i>	
<b>Choosing Project Leader Based on Interval Linguistic TOPSIS and Social Network Technology .....</b>	<b>310</b>
<i>Chen-Tung Chen, Wei-Zhan Hung</i>	
<b>Optimizing the Fuzzy Closed-loop Supply Chain for Electrical and Electronic Products .....</b>	<b>316</b>
<i>Phan Nguyen Ky Phuc, Vincent F. Yu</i>	
<b>A Fuzzy TOPSIS Approach for Medical Provider Selection and Evaluation.....</b>	<b>322</b>
<i>Shuo-Yan Chou, Vincent F. Yu, Luu Quoc Dat, Anindhita Dewabharata</i>	
<b>A Fuzzy Approach to Discriminating Heartbeat Types and Detecting Arrhythmia.....</b>	<b>327</b>
<i>Yo-Ping Huang, Shou-Ru Chen</i>	
<b>Design of PID Controller Using Hybrid Particle Swarm Optimization .....</b>	<b>333</b>
<i>Ming-Feng Yeh, Min-Shyang Leu, Kai-Min Chen</i>	
<b>An Adaptive Takagi-Sugeno-Kang Fuzzy Speed Controller Design for the Direct Torque Control.....</b>	<b>338</b>
<i>Shun-Yuan Wang, Chwan-Lu Tseng, Chun-Han Tseng, Wen-Tsung Shih</i>	
<b>A Robust Fuzzy Clustering Method with Outliers Influence Free .....</b>	<b>342</b>
<i>Li-Jen Kao, Yo-Ping Huang</i>	
<b>A Study of Mining Certain Itemsets from Uncertain Data .....</b>	<b>348</b>
<i>Cheng-Hsiung Weng</i>	
<b>Fuzzy Neural Networks for Speech Endpoint Detection .....</b>	<b>354</b>
<i>Gin-Der Wu, Zhen-Wei Zhu, An-Tai Li</i>	
<b>A Study of Hybrid Genetic-Fuzzy Models for IPO Stock Selection .....</b>	<b>357</b>
<i>Chien-Feng Huang, Ming-Yeah Tsai, Li-Min Kuo, Bao Rong Chang</i>	
<b>Vision-based 3D Head Pose Tracking using Fuzzy Classifier-based Face Segmentation and Silhouette Volume Intersection.....</b>	<b>363</b>
<i>Cheng-Shun Chang, Cuo-Cyuan Chen, Chia-Feng Juang</i>	
<b>An Adaptive Neuro-fuzzy Inference System for Sleep Spindle Detection.....</b>	<b>369</b>
<i>Sheng-Fu Liang, Chih-En Kuo, Yu-Han Hu, Chun-Yu Chen, Yu-Hung Li</i>	
<b>The Comprehensive Evaluation of Slope Vegetation Based on AHP and Fuzzy Math Method.....</b>	<b>374</b>
<i>Hai-Feng Dai, Xiao-Bo Xiong, Xin-Bo Zhang, Ke Chen</i>	
<b>Study on Fuzzy AHP Comprehensive Evaluation of the Landscape Ecology System in Highway .....</b>	<b>379</b>
<i>Xin-Bo Zhang, Xiao-Bo Xiong, Hai-Feng Dai, Zhi-Qiang Fan, Ke Chen</i>	
<b>Fuzzy Comprehensive Evaluation on the Integrity of the Large Bridge Super-Long Bored Piles .....</b>	<b>384</b>
<i>Xin-Bo Zhang, Xiao-Bo Xiong, Ke Chen, Zhi-Qiang Fan, Hai-Feng Dai</i>	
<b>Fuzzy Comprehensive Evaluation Based on Environmental Effect of Karst Tunnel Engineering.....</b>	<b>388</b>
<i>Zhi-Qiang Fan, Xiao-Bo Xiong, Xin-Bo Zhang, Hai-Feng Dai, Ke Chen</i>	
<b>Robust Fuzzy Inference System for Prediction of Time Series with Outliers.....</b>	<b>394</b>
<i>Yiming Bai, Tieshan Li</i>	
<b>A New Method for Fuzzy Interpolative Reasoning in Sparse Fuzzy Rule-Based Systems .....</b>	<b>400</b>
<i>Yu-Chuan Chang, Shyi-Ming Chen</i>	
<b>A Novel Guidance Law with Refining Fuzzy Membership Functions and Applying Neural Optimization Algorithms Alternatively .....</b>	<b>406</b>
<i>Jium-Ming Lin, Cheng-Hung Lin</i>	
<b>Adaptive Least Trimmed Squares Fuzzy Neural Network .....</b>	<b>413</b>
<i>Jyh-Yeong Chang, Shih-Hui Liao, Chin-Teng Lin</i>	
<b>Authors Index .....</b>	<b>417</b>
<b>Acknowledgments .....</b>	<b>421</b>