

2014 IEEE Symposium on Computational Intelligence in Control and Automation

(CICA 2014)

**Orlando, Florida, USA
9-12 December 2014**



**IEEE Catalog Number: CFP14CIA-POD
ISBN: 978-1-4799-4529-0**

TABLE OF CONTENTS

| | |
|--|------|
| IEEE SSCI 2014 General Committee | vi |
| IEEE CICA 2014 Committee..... | vii |
| Keynote Talk: CICA'14..... | viii |

Thursday, December 11

9:20AM-10:00AM

CICA'14 Keynote Talk

Fuzzy and Fuzzy-Polynomial Systems for Nonlinear Control: Overview and Discussion
Antonio Sala

10:20AM-12:00PM

CICA'14 Session 1: System Identification and Learning with Applications

Chair: G. N. Pillai and Eduardo M. A. M. Mendes

| | | |
|---------|--|----|
| 10:20AM | <i>One-Class LS-SVM with Zero Leave-One-Out Error</i> | 1 |
| | Geritt Kampmann and Oliver Nelles | |
| 10:40AM | <i>Extreme Learning ANFIS for Control Applications</i> | 7 |
| | G. N. Pillai, Jagtap Pushpak and Germin Nisha | |
| 11:00AM | <i>Collaborative Fuzzy Rule Learning for Mamdani Type Fuzzy Inference System with Mapping of Cluster Centers</i> | 15 |
| | Mukesh Prasad, Kuang-pen Chou, Amit Saxena, Om Prakash Kawrtiya, Dong-Lin Li and Chin-Teng Lin | |
| 11:20AM | <i>An Input-Output Clustering Approach for Structure Identification of T-S Fuzzy Neural Networks</i> | 21 |
| | Wei Li, Honggui Han and Junfei Qiao | |
| 11:40AM | <i>Real-Time Nonlinear Modeling of a Twin Rotor MIMO System Using Evolving Neuro-Fuzzy Network</i> | 29 |
| | Alisson Silva, Walmir Caminhas, Andre Lemos and Fernando Gomide | |

1:30PM-3:10PM

CICA'14 Session 2: Fuzzy Systems and Control with Applications

Chair: Li-Xin Wang and Tadanari Taniguchi

| | | |
|--------|--|----|
| 1:30PM | <i>Speculative Dynamical Systems: How Technical Trading Rules Determine Price Dynamics</i> | 37 |
| | Li-Xin Wang | |
| 1:50PM | <i>Adaptive Dynamic Output Feedback Control of Takagi-Sugeno Fuzzy Systems with Immeasurable Premise Variables and Disturbance</i> | 45 |
| | Balaje Thumati and Al Salour | |
| 2:10PM | <i>Optimal Robust Control for Generalized Fuzzy Dynamical Systems: A Novel Use on Fuzzy Uncertainties</i> | 53 |
| | Jin Huang, Jianguang Sun, Xibin Zhao and Ming Gu | |
| 2:30PM | <i>SOFC for TS fuzzy systems: Less Conservative and Local Stabilization Conditions</i> | 61 |
| | Leonardo Mozelli, Fernando Souza and Eduardo Mendes | |
| 2:50PM | <i>Quadrotor Control Using Dynamic Feedback Linearization Based on Piecewise Bilinear Models</i> | 68 |
| | Tadanari Taniguchi, Luka Eciolaza and Michio Sugeno | |

3:30PM-5:10PM

CICA'14 Session 3: Neural Network Systems and Control with Applications I

Chair: Ming Zhang Edgar N. Sanchez

| | | |
|--------|---|------------|
| 3:30PM | <i>Ultra High Frequency Polynomial and Sine Artificial Higher Order Neural Networks for Control Signal Generator</i> | <i>75</i> |
| | Ming Zhang | |
| 3:50PM | <i>Robust Pinning Control of Complex Dynamical Networks using Recurrent Neural Networks</i> | <i>83</i> |
| | Edgar N. Sanchez and David I. Rodriguez | |
| 4:10PM | <i>Dissolved Oxygen Control of Activated Sludge Bioreactors using Neural-Adaptive Control</i> | <i>90</i> |
| | Seyedhossein Mirghasemi, Chris J.B. Macnab and Angus Chu | |
| 4:30PM | <i>Estimation of States of a Nonlinear Plant using Dynamic Neural Network</i> | <i>96</i> |
| | Alok Kanti Deb and Dibyendu Guha | |
| 4:50PM | <i>Cascaded Free Search Differential Evolution Applied to Nonlinear System Identification Based on Correlation Functions and Neural Networks.....</i> | <i>102</i> |
| | Helon Vicente Hultmann Ayala, Luciano Cruz, Roberto Zanetti Freire and Leandro dos Santos Coelho | |

5:10PM-6:45PM

Poster Session: SSCI'14 Poster Session

| | | |
|------|--|------------|
| P180 | <i>Evolutionary Fixed-Structure Mu-Synthesis</i> | <i>109</i> |
| | Philippe Feyel, Gilles Duc and Guillaume Sandou | |

Friday, December 12

9:30AM-10:30AM

CICA'14 Session 4: Evolutionary Computation in Control and Automation

Chair: Alok Kanti Deb and Chixin Xiao

| | | |
|---------|---|------------|
| 9:30AM | <i>Constrained Multi-objective Evolutionary Algorithm Based on Decomposition for Environmental/Economic Dispatch.....</i> | <i>117</i> |
| | Yin Jianping, Xiao Chixin and Zhou Xun | |
| 9:50AM | <i>Grasping Novel Objects with a Dexterous Robotic Hand through Neuroevolution</i> | <i>125</i> |
| | Pei-Chi Huang, Joel Lehman, Aloysius K. Mok, Risto Miikkulainen and Luis Sentis | |
| 10:10AM | <i>New Multiagent Coordination Optimization Algorithms for Mixed-Binary Nonlinear Programming with Control Applications</i> | <i>133</i> |
| | Haopeng Zhang and Qing Hui | |

11:00AM-12:00PM

CICA'14 Session 5: Neural Network Systems and Control with Applications II

Chair: Jose Mario Araujo and Daniel Yuh Chao

| | | |
|---------|--|------------|
| 11:00AM | <i>Enumeration of Reachable, Forbidden, Live States of Gen-Left K-net System (with a non-sharing resource place) of Petri Nets</i> | <i>141</i> |
| | Daniel Yuh Chao and Tsung Hsien Yu | |
| 11:20AM | <i>Glucose Level Regulation for Diabetes Mellitus Type 1 Patients using FPGA Neural Inverse Optimal Control</i> | <i>148</i> |
| | Jorge C. Romero-Aragon, Edgar N. Sanchez and Alma Y. Alanis | |

| | | |
|---------|---|-----|
| 11:40AM | <i>Neural Network Fitting for Input-Output Manifolds of Online Control Laws in Constrained Linear Systems</i> | 155 |
| | Samarone Nascimento do Carmo, Marconi Oliveira de Almeida, Rafael Campos, Flavio Castro, Jose Mario Araujo and Carlos Eduardo Trabuco Dorea | |

1:30PM-3:10PM

CICA'14 Session 6: Applications of CI to Control and Automation

Chair: Alexander Kochegurov and Li-Xin Wang

| | | |
|--------|---|-----|
| 1:30PM | <i>What Happens When Trend-Followers and Contrarians Interplay in Stock Market</i> | 161 |
| | Li-Xin Wang | |
| 1:50PM | <i>An efficient Method to Evaluate the Performance of Edge Detection Techniques by a two-dimensional Semi-Markov Model</i> | 169 |
| | Dmitry Dubinin, Viktor Geringer, Alexander Kochegurov and Konrad Reif | |
| 2:10PM | <i>Design and Implementation of a Robust Fuzzy Controller for a Rotary Inverted Pendulum using the Takagi-Sugeno Descriptor Representation</i> | 176 |
| | Quoc Viet Dang, Benyamine Allouche, Laurent Vermeiren, Antoine Dequidt and Michel Dambrine | |
| 2:30PM | <i>Ensuring safe prevention and reaction in smarthome systems dedicated to people becoming disabled</i> | 182 |
| | Sebastien Guillet, Bruno Bouchard and Abdenour Bouzouane | |
| 2:50PM | <i>How to Detect Big Buyers in Hong Kong Stock Market and Follow Them Up to Make Money</i> | 190 |
| | Li-Xin Wang | |

3:30PM-5:10PM

CICA'14 Session 7: Computational Intelligence in Robotics

Chair: Yongping Pan Andrei Petrovski

| | | |
|--------|--|-----|
| 3:30PM | <i>Calibration between a Laser Range Scanner and an Industrial Robot Manipulator</i> | 198 |
| | Thomas Timm Andersen, Nils Axel Andersen and Ole Ravn | |
| 3:50PM | <i>Context-based Adaptive Robot Behavior Learning Model (CARB-LM)</i> | 206 |
| | Joohee Suh and Dean Hougen | |
| 4:10PM | <i>Biomimetic Hybrid Feedback Feedforward Adaptive Neural Control of Robotic Arms</i> | 214 |
| | Yongping Pan and Haoyong Yu | |
| 4:30PM | <i>Improved Multiobjective Particle Swarm Optimization for Designing PID Controllers Applied to Robotic Manipulator</i> | 221 |
| | Juliano Pierezan, Helon V. H. Ayala, Luciano F. Cruz, Leandro dos S. Coelho and Roberto Z. Freire | |
| 4:50PM | <i>Automated Inferential Measurement System for Traffic Surveillance: Enhancing Situation Awareness of UAVs by Computational Intelligence</i> | 229 |
| | Prapa Rattadilok and Andrei Petrovski | |

| | |
|---------------------------|-----|
| AUTHOR INDEX | 237 |
|---------------------------|-----|