

Welcome Message from the Program Co-Chairs

The organizing committee welcomes you to the 2011 IEEE International Conference on Computational Intelligence for Measurement Systems and Applications (IEEE CIMSA 2011), held in Ottawa, Ontario, Canada, on September 19-21, 2011. This meeting, co-sponsored by the IEEE Computational Intelligence Society and the IEEE Instrumentation and Measurement Society, is the ninth of a successful series that extends its roots back to the 1996 IEEE Workshop on Emerging Technologies for Instrumentation and Measurement, as a profound evidence of the continuous and even increasing interest in this research and applications area.

The three-day conference program aims to provide a forum for the attendees to carry out presentations, information exchanges, extensive formal and informal discussions on theory, methodology and applications in the field of interest of the conference, as well as to foster networking, planning for future collaborations and new research projects that will further extend and advance the use of computational intelligence in the instrumentation and measurement field in an informal setting arranged to encourage broad discussion about theory, methodologies and results. We hope the conference will foster and discuss opportunities and challenges in using computational intelligence breakthroughs aiming to the advancement of instrument performance and measurement capabilities, and related applications. To promote interaction and discussion in the audience, sufficient time is allotted to presenters not only to introduce their achievements, but also to engage in extended discussions with the participants. Subjects of discussion include, but are not restricted to, critical evaluation of approaches and results, the rationale underlying particular methodologies, experimental and theoretical examinations, practical difficulties, insights, and extensions to other application areas.

The IEEE CIMSA 2011 conference is held in parallel with the 2011 IEEE International Conference on Virtual Environments, Human-Computer Interfaces and Measurement Systems (IEEE VECIMS 2011). Due to their many common aspects and shared technologies, this parallel organization will foster vivid and rewarding interaction among the participants of the two events, and contribute to sharing advanced knowledge and producing stimulating experiences as well as potential research synergies.

We hope you will find IEEE CIMSA 2011 a challenging and productive experience. We trust that you will also enjoy the location, the culture and the food: Ottawa will be an exciting experience!

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Richard J. Duro, Universidade da Coruna, Spain

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Enrique Ruspini, European Centre for Soft Computing, Spain
Fabio Scotti, Università degli Studi di Milano, Italy

Technical Program Chairs

Fernando Lopez Pena, Universidade da Coruna, Spain
Gourab Sen Gupta, Massey University, New Zealand
Slawomir Wesolkowski, DRDC, Ottawa, Canada

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Gourab Sen Gupta, Massey University, New Zealand
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Monday, September 19, 2011

9:00 - 10:15 **Registration**

10:15 - 10:30 **Coffee Break**

10:30 - 10:45

Opening Session

Room: 12102

10:45 - 12:15

Security Applications

Room: 12102

10:45 **An ANN based Hyperspectral Waterway Control and Security System**

Blanca Priego, Universidade da Coruna

Daniel Souto, Universidade da Coruna

Fernando Lopez Peña, Universidade da Coruna

Richard J. Duro, Universidade da Coruna

11:15 **Facial Expression Anlysis using Eye Gaze Information**

Yisu Zhao, University of Ottawa

Xin Wang, University of Ottawa

Emil M. Petriu, University of Ottawa

11:45 **Hand Gesture Detection and Recognition Using Principal Component Analysis**

Nasser H. Dardas, University of Ottawa

Emil M. Petriu, University of Ottawa

12:15 - 13:45 **Lunch**

13:45 - 15:15

Environmental Applications I

Room: 12102

13:45 **Intelligent Control of Bioreactor Landfills**

Mohamed Abdallah, University of Ottawa

Emil M. Petriu, University of Ottawa

Kevin Kennedy, University of Ottawa

Roberto Narbaitz, University of Ottawa

Mostafa Warith, University of Ottawa

14:15 **Application of Fuzzy Logic in Modern Landfills**

Mohamed Abdallah, University of Ottawa

Emil M. Petriu, University of Ottawa

Kevin Kennedy, University of Ottawa

Roberto Narbaitz, University of Ottawa

Mostafa Warith, University of Ottawa

14:45 **On Stockpile Planning Using a Multi-Objective Genetic Algorithm**

Raman Pall, Defence R&D Canada

15:15 - 15:30 **Coffee Break**

15:30 - 17:00

Environmental Applications II

Room: 12102

- 15:30 Wildfire Smoke Detection Using Computational Intelligence Techniques**
Angelo Genovese, Università degli Studi di Milano
Ruggero Donida Labati, Università degli Studi di Milano
Vincenzo Piuri, Università degli Studi di Milano
Fabio Scotti, Università degli Studi di Milano
- 16:00 An Adaptable System for Energy Management in Intelligent Buildings**
Blerim Qela, University of Ottawa
Hussein Mouftah, University of Ottawa
- 16:30 Personal dosimeter for the measurement of artificial optical radiation (AOR) exposure**
Alessandro Quarto, MYHERMES srl
Vincenzo Di Lecce, Politecnico di Bari
Rita Dario, ASL-Bari
Jessica Uva, Politecnico di Bari

Tuesday, September 20, 2011

9:00 - 10:30

Feature Selection

Room: 12102

- 9:00 A Gaussian Radial Basis Function Based Feature Selection Algorithm**
Zhiliang Liu, University of Electronic Science & Technology of China
Ming Jian Zuo, University of Alberta
Hongbing Xu, University of Electronic Science & Technology of China
- 9:20 Effect of Feature Selection on Machine Learning Algorithms for More Accurate Predictor of Surgical Outcomes in Benign Prostatic Hyperplasia Cases (BPH)**
Dalila B. Megherbi, University of Massachusetts, Lowell
- 9:40 Salient Features Based on Visual Attention for Multi-View Vehicle Classification**
Ana-Maria Cretu, University of Ottawa
Pierre Payeur, University of Ottawa
Robert Laganiere, University of Ottawa
- 10:30 - 10:45 Coffee Break**

10:45 - 12:15

Prediction

Room: 12102

10:45

Ship Roll Motion Time Series Forecasting Using Neural Network

Fernando Lopez Peña, Universidade da Coruña

Marcos Míguez Gonzalez, Universidade da Coruña

Vicente Díaz Casás, Universidade da Coruña

Richard J. Duro, Universidade da Coruña

11:15

Neural Fractal Prediction of Three Dimensional Surface Roughness

Xin Wang, University of Ottawa

Emil M. Petriu, University of Ottawa

11:45

Design A Fuzzy Expert System for Prediction of Concrete Compressive Strength

Mehdi Neshat, Azad University Mashhad

12:15 - 13:45

Lunch

13:45 - 15:15

Classification

Room: 12102

13:45

Classification of Gear Damage Levels in Planetary Gearboxes

Zhiliang Liu, University of Electronic Science & Technology of China

Ming Jian Zuo, University of Alberta

Jian Qu, University of Alberta

Hongbing Xu, University of Electronic Science & Technology of China

14:15

Classification of Road Conditions From Camera Images and Weather Data

Patrik Jonsson, Mid Sweden University

14:45

Discriminating Gaseous Emission Patterns in Low-Cost Sensor Setups

Vincenzo Di Lecce, Politecnico di Bari

Marco Calabrese, Politecnico di Bari

15:15 - 15:30

Coffee Break

15:30 - 17:00

Control

Room: 12102

15:30

Low-Cost Optimal State Feedback Fuzzy Control of Nonlinear Second-Order Servo Systems

Mircea-Bogdan Radac, Politehnica University of Timisoara

Radu-Emil Precup, Politehnica University of Timisoara

Emil M. Petriu, University of Ottawa

Paul Andrei Ianc, Politehnica University of Timisoara

Stefan Preitl, Politehnica University of Timisoara

Claudia-Adina Dragos, Politehnica University of Timisoara

16:00

Experimental Validation of Recurrent Neuro-Fuzzy Networks for AFR Estimation and Control in SI Engines

Fereshteh Barghi, Shiraz University

Ali Akbar Safavi, Shiraz University

16:30

Intelligent Probabilistic-Fuzzy Controller

Manish Agarwal Indian Institute of Technology

K. K. Biswas, Indian Institute of Technology

Madasu Hanmandlu, Indian Institute of Technology

19:30

Banquet

Wednesday, September 21, 2011

9:00 - 10:30

Computational Intelligence Technologies for Measurement Systems I

Room: 12102

9:00

An Evolving Risk Management Framework for Wireless Sensor Networks

Rafael Falcon, University of Ottawa

Rami Abielmona, Larus Technologies Corporation

Amiya Nayak, University of Ottawa

9:30

Genetic Algorithm Based Efficient Tag Detection in RFID Reader Networks

Nazish Irfan, University of Ottawa

Khalifa Hettak, Communications Research Centre (CRC)

Mustapha C.E. Yagoub, University of Ottawa

10:00

Unsupervised Feature Selection based on Fuzzy Partition Optimization for Industrial Processes Monitoring

Cesar Uribe, Universidad de Antioquia

Claudia Isaza, Universidad de Antioquia

10:30 - 10:45

Coffee Break

10:45 - 12:15

Computational Intelligence Technologies for Measurement Systems II

Room: 12102

10:45 Networking Logistic Neurons can Yield Chaotic and Pattern Recognition Properties

*Qin Ke, University of Electronic Science & Technology of China
John B. Oommen, Carleton University*

11:15 Relations in Generalized Intuitionistic Fuzzy Soft Set

*Manish Agarwal, Indian Institute of Technology
K. K. Biswas, Indian Institute of Technology
Madasu Hanmandlu, Indian Institute of Technology*

11:45 Improved Particle Swarm Optimization and Applications to Hidden Markov Model and Ackley Function

*Saeed Motiian, University of Tehran
Hamid Soltanian-Zadeh, University of Tehran*

12:15 - 13:45 Lunch

13:45 - 15:15

Aerospace Applications

Room: 12102

13:45 Research on Nonlinear Control Methods for On-Orbit Servicing with Visual Positioning System

*Yang Weiwei, National University of Defense Technology
Zhao Yong, National University of Defense Technology
Huang Yiyong, National University of Defense Technology
Xiaoqian Chen, National University of Defense Technology
Wang Zhenguo, National University of Defense Technology*

14:15 The Algorithm of High Precision Attitude Determination with Low Precision Sensors Based on Data Fusion

*Cao Lu, National University of Defense Technology
Tao Shen, National University of Defense Technology
Xiaoqian Chen, National University of Defense Technology*

14:45 Multivariable Controller design for Aircraft Longitudinal Autopilot Based on Particle Swarm Optimization Algorithm

*Bahram Karimi, Malekashtar University of Technology
Mostafa Lotfi-Forushani, Islamic Azad University, Najafabad Branch
Iman Saboori, Amirkabir University of Technology*

15:15 - 15:30 Coffee Break