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Welcome Message from the Chairpersons

The organizing committee is honored to welcome you to the 2016 IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (IEEE CIVEMSA 2016), held in Budapest, Hungary, on June 27-28, 2016.

This conference, co-sponsored by the IEEE Computational Intelligence Society and the IEEE Instrumentation and Measurement Society, roots back to the 1996 IEEE Workshop on Emerging Technologies for Instrumentation and Measurement, and continue the interdisciplinary experience of the previous technical meetings IEEE CIMSA and IEEE VECIMS by filling the gap in knowledge and practice, focusing on all aspects of computational intelligence, human-computer interaction technologies, and virtual environments for measurement systems and the related applications, from the points of view of both theory and practice.

The two-day conference program aims to provide a forum for the attendees to carry out presentations, information exchanges, extensive 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 advance the use of computational intelligence and virtual environments in the instrumentation and measurement field and the related applications. We hope the conference will foster and discuss opportunities and challenges in using computational intelligence and virtual environments breakthroughs aiming to the advancement of instrument performance and measurement capabilities, and all related applications in a broad spectrum of areas. 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.

We hope you will find IEEE CIVEMSA 2016 a challenging and productive experience. We trust that you will also enjoy the location, the culture and the food: Budapest will be an exciting experience!

<i>Honorary Chairs:</i>	Imre Rudas, Obuda University, Hungary Hairong Zheng, SIAT, China
<i>General Chairs:</i>	Annamaria R. Varkonyi-Koczy, Obuda University, Hungary Stefano Ferrari, Università degli Studi di Milano, Italy Yong Hu, The University of Hong Kong, IBME CAMS, China
<i>Program Chairs:</i>	Shervin Shirmohammadi, University of Ottawa, Canada Ruggero Donida Labati, Università degli Studi di Milano, Italy

IEEE CIVEMSA 2016 Organizers

Honorary Co-Chairs

Imre Rudas, Obuda University, Hungary
Hairong Zheng, SIAT, China

General Co-Chairs

Annamaria R. Varkonyi-Koczy, Obuda University, Hungary
Stefano Ferrari, Università degli Studi di Milano, Italy
Yong Hu, The University of Hong Kong, IBME CAMS, China

Technical Program Co-Chairs

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Shervin Shirmohammadi, University of Ottawa, Canada

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Teréz A. Várkonyi, Óbuda University, Hungary

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Cesare Alippi, Politecnico di Milano, Italy
Enrique Ruspini, European Centre for Soft Computing, Spain
Shervin Shirmohammadi, University of Ottawa, Canada
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Peter Wide, University of Nordland, Norway

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IEEE CIVEMSA 2016 Technical Program Committee

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Francesco Bellocchio, Fresenius Medical Care, Italy
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Ian P. W. Sillitoe, University of Wolverhampton, United Kingdom
Zhiguo Zhang, Nanyang Technological University, Singapore

**Thank you to all of the reviewers for IEEE CIVEMSA 2016*

Opening Keynote Speaker

Prof. Imre J. Rudas – “Cloud Robotics”

June 27, 2016

Location: Rákóczi I.

Chair: Annamária R. Várkonyi-Kóczy (Óbuda University, Hungary)

Abstract

Cloud Robotics is an emerging field within robotics, currently covering various application domains and robot network paradigms. Cloud Robotics was born from the merger of cloud technologies and robotics. Cloud technology-based computing—or simply Cloud Computing—is one of the most dynamically growing areas of Info-Communication Technologies (ICT).

The presentation summarizes the basics of cloud computing, namely the main idea, the definition, the cloud model composed of essential characteristics, service models and deployment models.

The next part provides a structured, systematic overview of the numerous definitions, concepts and technologies linked to Cloud Robotics and cloud technologies in a broader sense. It also presents a roadmap for the near future, describing development trends and emerging application areas. Cloud Robotics may have a significant role in the future as an explicitly human-centered technology, capable of addressing the dire needs of our society. Finally, some cloud robotics projects are discussed.

The last part of the presentation summarizes the results and ideas of a new generation internet and Cloud Technology based Virtual Collaboration Arena (VirCA) developed in Hungary and some of its application possibilities in Cloud Robotics.

VirCA provides a platform where users can build, share and manipulate 3D content, and collaboratively interact with real-time processes in a 3D context, while the participating hardware and software devices can be spatially and/or logically distributed and connected together via IP network. The 3D content and processes in VirCA can be synchronized with the real world, which allows the combination of reality and virtual world in the collaboration arena

Curriculum Vitae

Imre J. Rudas graduated from Bánki Donát Polytechnic, Budapest in 1971, received the Master Degree in Mathematics from the Eötvös Loránd University, Budapest, the Ph.D. in Robotics from the Hungarian Academy of Sciences in 1987, while the Doctor of Science degree from the Hungarian Academy of Sciences in 2004. He received his first Doctor Honoris Causa degree from the Technical University of Košice, Slovakia, the second one from “Polytechnica” University of Timisoara, Romania and the third one from Óbuda University, Budapest. He was awarded by the Honorary Professor title of Wroclaw University in 2013.

He is active as a full university professor. He served as the President of Budapest Tech from 2003 till 2010. He was the founder of Óbuda University, the successor of Budapest Tec and was elected as the first President in the period 2010-2014. He served as the President of the Hungarian Rector’s Conference and member of European University Association in 2008. Now he is the Head of the Steering Committee of the University Research and Innovation Center. He has been the president of the Central European Living Lab for Intelligent Robotics since 2014.

He is a Fellow of IEEE, Senior AdCom member of Industrial Electronics Society (IES), he served IES as a Vice-President in 2000-2001. He was elected as the Vice-President for Membership and Student Activities in IEEE System, Man and Cybernetics Society for the period 2014-2015. He is the Junior Past Chair of IEEE Hungary Section.

He served IFSA (International Fuzzy System Association) as Vice-President and Treasure for a period of 7 years; he had been the President of Hungarian Fuzzy Association for ten years. He had been the Vice-President of the Hungarian Academy of Engineers for four years.

He serves as an associate editor of some scientific journals, including IEEE Transactions on Industrial Electronics, member of editorial board of Journal of Advanced Computational Intelligence, Editor-in-Chief of Acta Polytechnica Hungarica, member of various national and international scientific committees. He is the founder of the IEEE International Conference Series on Intelligent Engineering Systems (INES), IEEE International Conference on Computational Cybernetics (ICCC), IEEE International Symposium on Computational Intelligence and Informatics (CINTI, since 2000), IEEE International Symposium on Machine Intelligence and Informatics (SAMI, since 2003), IEEE International Symposium on Intelligent Systems and Informatics (SISY, since 2003), IEEE International Symposium on Applied Computational Intelligence and Informatics (SACI, since 2004), IEEE International Symposium on Logistics and Industrial Informatics (LINDI, since 2007). He has served as General Chair and Program Chair of numerous scientific international conferences.

His present areas of research activities are Computational Cybernetics, Robotics with special emphasis on Robot Control, Cloud Robotics, Internet of Anything, Soft Computing, Fuzzy Control and Fuzzy Sets. He has edited and/or published 22 books, 788 papers in international scientific journal, conference proceedings and book chapters, he received 1244 independent citations (<https://vm.mtmt.hu>).

Social Events

**Conference Dinner
Restaurant Spoon the Boat
Monday, June 27, 2016
19:30 – 22:30**



Program Schedule – Monday, June 27

Monday – 27/06/2016	
8:30 – 16:30	Registration
9:00 – 9:10	Welcome – Room: Rákóczi I.
9:10 – 10:15	Opening Keynote – Room: Rákóczi I. Chair: Annamária R. Várkonyi-Kóczy
10:15 – 10:30	Coffee Break – Room: Rákóczi I Foyer
10:30 – 12:00	<i>Session 1: Intelligent Monitoring, Control, and Measurement</i> Room: Rákóczi I. Chair: Stefano Ferrari
12:00 – 13:30	Lunch – Café Palace Restaurant
13:30 – 15:00	<i>Session 2: Image Understanding and Analysis</i> Room: Rákóczi I. Chair: Qiuyu Zhu
15:00 – 15:30	Coffee Break – Room: Rákóczi I Foyer
15:30 – 16:30	<i>Session 3: Collaborative Virtual Environments and Augmented Reality</i> Room: Rákóczi I. Chairs: Ruggero Donida Labati
19:30 – 22:30	Dinner – Restaurant Spoon the Boat

Program Schedule – Tuesday, June 28

Tuesday – 28/06/2016	
8:30 – 17:00	Registration
9:00 – 11:00	<i>Session 4: Computational Intelligence for Medical and Bioengineering Applications</i> Chair: Dalila Megherbi
11:00 – 11:30	Coffee Break – Room: Rákóczi I Foyer
11:30 – 12:30	<i>Session 5: Sensors</i> Chair: Dali Wang
12:30 – 14:00	Lunch - Café Palace Restaurant
14:00 – 15:00	<i>Session 6: Decision Making</i> Chair: Rummenigge Dantas
15:00 – 15:30	Coffee Break – Room: Rákóczi I Foyer
15:30 – 17:00	<i>Session 7: Fuzzy Systems and Event Processing</i> Chair: Yong Hu

Monday, June 27

All sessions will take place in **Rákóczi I.*

8:30 – 16:30

Registration

9:00 – 9:10

Welcome

9:10 – 10:15

Opening Keynote – Imre J. Rudas

Chair: Annamária R. Várkonyi-Kóczy (Óbuda University, Hungary)

10:15 – 10:30

Coffee Break

Room: Rákóczi I Foyer

10:30 – 12:00

Session 1: Intelligent Monitoring, Control, and Measurement

Chair: Stefano Ferrari (Università degli Studi di Milano, Italy)

Vehicle Detector Under Parallel Binocular Cameras

Hui Wang (Shanghai University, P.R. China)

Qiuyu Zhu (Shanghai University, P.R. China)

Chunlong Shen (Shanghai University, P.R. China)

Weinan Huang (Shanghai University, P.R. China)

Measurement Classification Using Hybrid Weighted Naive Bayes

David Hamblin (Christopher Newport University, USA)

Dali Wang (Christopher Newport University, USA)

Gao Chen (NASA Langley, USA)

A Hybrid P2P and Master-Slave Cooperative Distributed Multi-Agent Reinforcement Learning Technique with Asynchronously Triggered Exploratory Trials and Clutter-index-based Selected Sub-goals

Dalila B. Megherbi (University of Massachusetts, Lowell, USA)

Minsuk Kim (University of Massachusetts, Lowell, USA)

12:00 – 13:30

Lunch

Location: Café Palace Restaurant

Monday, June 27

13:30 – 15:00

Session 2: Image Understanding and Analysis

Chair: Qiuyu Zhu (Shanghai University, China)

A Content-Based Image Retrieval Technique with Tolerance Via Multi-Page Differentiable Hashing and Binary-Tree Searching Multi-object Buckets

Peter Mack (University of Massachusetts, Lowell, USA)

Dalila B. Megherbi (University of Massachusetts, Lowell, USA)

Analyzing images in frequency domain to estimate the quality of wood particles in OSB production

Enrique Munoz Ballester (Università degli Studi di Milano, Italy)

Ruggero Donida Labati (Università degli Studi di Milano, Italy)

Angelo Genovese (Università degli Studi di Milano, Italy)

Fabio Scotti (Università degli Studi di Milano, Italy)

Gianluca Sforza (Università degli Studi di Milano, Italy)

Vincenzo Piuri (Università degli Studi di Milano, Italy)

Tracking and modeling raindrops in video sequences for assessing precipitation

Chih-Yen Chen (Instrument Technology Research Center, Taiwan)

Chi-Wen Hsieh (National Chiayi University, Taiwan)

Chun-Jen Weng (Instrument Technology Research Center, Taiwan)

Chi-Hung Hwang (Instrument Technology Research Center, Taiwan)

Shun-Chung Tsung (Taiwan Typhoon and Flood Research Institute, Taiwan)

15:00 – 15:30

Coffee Break

Room: Rákóczi I Foyer

15:30 – 16:30

Session 3: Collaborative Virtual Environments and Augmented Reality

Chairs: Ruggero Donida Labati (Università degli Studi di Milano, Italy)

An Architecture for Web-Based Collaborative 3D Virtual Spaces Using DOM Synchronization

Cristian Gadea (University of Ottawa, Canada)

Daniel Hong (University of Ottawa, Canada)

Dan Ionescu (University of Ottawa, Canada)

Bogdan Ionescu (Mgestyk Technologies Inc., Canada)

Using 6 DOF Vision-Inertial Tracking to Evaluate and Improve Low Cost Depth Sensor based SLAM

Thomas Calloway (University of Massachusetts, Lowell, USA)

Dalila B. Megherbi (University of Massachusetts, Lowell, USA)

19:30 – 22:30

Dinner

Location: Restaurant Spoon the Boat

Tuesday, June 28

8:30 – 17:00

Registration

9:00 – 11:00

Session 4: Computational Intelligence for Medical and Bioengineering Applications

Chair: Dalila Megherbi (University of Massachusetts, Lowell, USA)

Identifying the location of spinal cord injury by support vector machines using time-frequency features of somatosensory evoked potentials

Yazhou Wang (The University of Hong Kong, P.R. China)

Yong Hu (The University of Hong Kong, P.R. China)

Spontaneous EEG-Based Normalization of Pain-evoked Neural Responses: Effect on Improving the Accuracy of Pain Prediction

Yanru Bai (Nanyang Technological University, Singapore)

Yong Hu (The University of Hong Kong, P.R. China)

Zhiguo Zhang (Sun Yat-Sen University, P.R. China)

A Novel Hybrid of S2DPCA and SVM for Knee Osteoarthritis Classification

Rima Tri Wahyuningrum (Institut Teknologi Sepuluh Nopember, Indonesia)

I Ketut Eddy Purnama (Institut Teknologi Sepuluh Nopember, Indonesia)

Mauridhi Hery Purnomo (Institut Teknologi Sepuluh Nopember, Indonesia)

Lilik Anifah (Universitas Negeri Surabaya, Indonesia)

A Machine Learning Based Prognostic Prediction of Cervical Myelopathy Using Diffusion Tensor Imaging

Yong Hu (University of Hong Kong, P.R. China)

Richu Jin (University of Hong Kong, P.R. China)

Keith Dk Luk, (University of Hong Kong, P.R. China)

Jason Chueng (University of Hong Kong, P.R. China)

11:00 – 11:30

Coffee Break

Room: Rákóczi I Foyer

Tuesday, June 28

11:30 – 12:30

Session 5: Sensors

Chair: Dali Wang (Christopher Newport University, USA)

Secured and Energy Efficient Architecture for Sensor Networks

Jetendra Joshi (NIIT University, India)

Divya Sara Kurian (NIIT University, India)

Amrit Bagga (NIIT University, India)

Abhinandan Bhargava (NIIT University, India)

Urjit Kurulkar (NIIT University, India)

Abhinav Goel (NIIT University, India)

PHYS.IO: Wearable Hand Tracking Device

Lucas Silva (Universidade Federal do Rio Grande do Norte, Brazil)

Paula Diniz (Universidade Federal do Rio Grande do Norte, Brazil)

Victor Oliveira (Universidade Federal do Rio Grande do Norte, Brazil)

Luque Bueno (Universidade Federal do ABC, Brazil)

Rummenigge Dantas (Universidade Federal do Rio Grande do Norte, Brazil)

Thiago Dutra (Universidade Federal do Rio Grande do Norte, Brazil)

12:30 – 14:00

Lunch

Location: Café Palace Restaurant

14:00 – 15:00

Session 6: Decision Making

Chair: Rummenigge Dantas (Universidade Federal do Rio Grande do Norte, Brazil)

A Fuzzy Multi-Criteria Decision Approach to Identify Measurement Instruments

Dali Wang (Christopher Newport University, USA)

Elliot Rieflin (Christopher Newport University, USA)

Gao Chen (NASA Langley, USA)

Multi Attribute Decision Making Model Using Multi Rough Set: Case Study

Classification of Anger Intensity of Javanese Woman

Nurul Zainal Fanani (Institut Teknologi Sepuluh Nopember, Indonesia)

Ulla Delfana Rosiani (Institut Teknologi Sepuluh Nopember, Indonesia)

Surya Sumpeno (Institut Teknologi Sepuluh Nopember, Indonesia)

Mauridhi Hery Purnomo (Institut Teknologi Sepuluh Nopember, Indonesia)

15:00 – 15:30

Coffee Break

Room: Rákóczi I Foyer

Tuesday, June 28

15:30 – 17:00

Session 7: Fuzzy Systems and Event Processing

Chair: Yong Hu (The University of Hong Kong, Hong Kong)

On the Comparison of an Interval Type-2 Fuzzy Interpolation System and Other Interpolation Methods Used in Industrial Modeless Robotic Calibrations

Ying Bai (Johnson C. Smith University, USA)

Dali Wang (Christopher Newport University, USA)

A Novel Fuzzy Logic Control for Bidirectional DC-DC Converter and Comparison with Dual Phase-Shift Control Method in Medium Voltage Applications

Rahmi İlker Kayaalp (Çukurova University, Turkey)

Tuğçe Demirdelen (Çukurova University, Turkey)

Mehmet Tumay (Çukurova University, Turkey)