The 12th International Conference on
SIGNAL IMAGE TECHNOLOGY & INTERNET BASED SYSTEMS

November 28 - December 1, 2016
Naples, Italy

www.sitis-conf.org

SITIS 2016
For their invaluable contributions, our gratitude to:

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SITIS 2016
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Foreword

The 12th International Conference on Signal–Image Technology & Internet-based Systems (SITIS’16) includes four main tracks SIVT, I-WeCA, MIRA and SLNA. The track on “Signal Image & Vision Technology” (SIVT) is aimed at recent developments in digital signal processing, evolutions in audiovisual signal processing, analysis, coding and authentication, and retrieval techniques. The track “Intelligent Web Computing and Application” (I-WeCA) focuses on issues ranging from information modeling and retrieval techniques to novel concepts, architectures and methodologies for interconnecting information systems. The track titled “Multimedia Information Retrieval and Application” (MIRA) is focused on emerging modeling, representation and retrieval techniques that take into account the amount, type and diversity of multimedia information accessible in distributed computing environment. Finally, the focus of the “Social Networks, Large Networks and their Applications” (SLNA) track is on emerging and novel concepts, architectures and methodologies for social networks analysis, tools and applications, including issues related to complex graphs, semantics, big data, and security.

In addition to the main tracks, the SITIS conference this year hosts 11 workshops, covering a wide range of related topics. These workshops are on:

- Visions on Internet of Cultural Things and Applications (VICTA)
- Artificial Intelligent Approaches for Image Processing (IWAIIIP)
- Numerical Algorithms and Methods for Data Analysis and Classification (NAMDAC)
- Human Tracking and Behavior Analysis (HTBA)
- Knowledge Acquisition, Reuse and Evaluation (KARE)
- Computational Intelligence Techniques for Industrial and Medical Applications (CITIMA)
- Big Data meets Cloud and Virtualized Environment (BigCVEn)
About 220 original submissions were received from around the world. 115 papers are selected for presentation and publication in the conference proceedings. A peer review process was carried out by each track and workshop. Each paper received 2 or 3 reviews, several received up to 5 reviews. Each paper is evaluated based on relevance to track or workshop topics, scientific correctness and clarity of presentation.

The success of the conference owes to the dedication of many. They have contributed in many different ways to the selection of a fine scientific program and exciting social events. First, we acknowledge the commitment and hard work of the track and workshop chairs who have kept the scientific program in focus and made the discussions interesting and invaluable. We recognize the commitment and contributions of the program committee members and the extra reviewers for evaluating the papers on a very tight time schedule. We could not have done it without them.

Our heartfelt gratitude goes to our academic sponsor institutions for their cooperation, support and assistance: University of Bourgogne, Institute of High Performance Computing and Networking of the National Research Council of Italy, University of Naples “Federico II”, University of Milan, “LE2I (Laboratoire Electronique, Image et Informatique)” research group at the University of Bourgogne. More importantly, we thank the authors for submitting and trusting their work to the conference.

We thank the Conference Honorary Chair, Professor Gaetano Manfredi, Rector of the University of Naples “Federico II”. Our kudos to Giuseppe De Pietro, the Conference General Chair, for his invaluable support and tireless dedication. Last, we thank all the members of the local organizing committee. A special thank you goes to Francesco Schisano, Enza Di Vuolo and the staff at YesMeet agency.

We hope the scientific program of SITIS 2016 lives up to your expectations. We hope you will find time to enjoy the “scientific discussions” and all the beautiful sights and events that the city of Naples can offer. We wish you well.

The Organizing Committee:  
Kokou Yetongnon, Albert Dipanda, Richard Chbeir  
Giuseppe De Pietro, Luigi Gallo
Keynote1

Computational Intelligence for Signal and Image Processing in Industrial and Environmental Applications

Vincenzo Piuri, Università degli Studi di Milano, Italy

Abstract

Adaptability and advanced services for industrial manufacturing require an intelligent technological support for understanding the production process characteristics also in complex situations. Quality control is specifically one of the activities in manufacturing which is very critical for ensuring high-quality products and competitiveness on the market. Similarly, environmental monitoring increasingly needs adaptive approaches to deal with variability and evolvability of the environmental phenomena. Earth observation and pollution monitoring are very demanding in this perspective. Computational intelligence can provide additional flexible techniques for designing and implementing monitoring and control systems, which can be configured from behavioral examples or by mimicking approximate reasoning processes to achieve adaptable systems. This talk will analyze the opportunities offered by computational intelligence technologies to support signal and image processing for adaptable operations and intelligent services both in industrial applications, specifically focusing on manufacturing processes and quality control, and in environmental monitoring, focusing on Earth observation and pollution monitoring.

Biography

Vincenzo Piuri has received his Ph.D. in computer engineering at Politecnico di Milano, Italy (1989). He is Full Professor in computer engineering at the Università degli Studi di Milano, Italy (since 2000). He has been Associate Professor at Politecnico di Milano, Italy and Visiting Professor at the University of Texas at Austin and at George Mason University, USA. His main research interests are: computational intelligence, signal and image processing, intelligent systems, machine learning, pattern analysis and recognition, theory and industrial applications of neural networks, intelligent measurement systems, industrial applications, biometrics, fault tolerance, digital processing architectures, and cloud computing infrastructures. Original results have been published in more than 350 papers in international journals, proceedings of international conferences, books, and book chapters. He is Fellow of the IEEE, Distinguished Scientist of ACM, and Senior Member of INNS. He is IEEE Past Vice President for Technical Activities (2016) and has been IEEE Vice President for Technical Activities, IEEE Director, President of the IEEE Computational Intelligence Society, Vice President for Education of the IEEE Biometrics Council, Vice President for Publications of the IEEE Instrumentation and Measurement Society and the IEEE Systems Council, and Vice President for Membership of the IEEE Computational Intelligence Society. He is Editor-in-Chief of the IEEE Systems Journal (2013-17), and has been Associate Editor of the IEEE Transactions on Neural Networks and the IEEE Transactions on Instrumentation and Measurement. He received the IEEE Instrumentation and Measurement Society Technical Award (2002) for the contributions to the advancement of theory and practice of computational intelligence in measurement systems and industrial applications. He is Honorary Professor at the Obuda University, Budapest, Hungary (since 2014), Guest Professor at Guangdong University of Petrochemical Technology, China (since 2014), and Guest Professor at the Muroran Institute of Technology, Japan (since 2016). More information are available at http://www.di.unimi.it/piuri
Deterministic and Bayesian Sparsity enforcing models in signal and image processing  
Ali Mohammad-Djafari, Centrale-Supélec, France

Abstract
In this talk, first examples of sparse signals and images are presented. Then, different deterministic ways of modeling and sparse representation methods and algorithms (MP, OMP, LASSO, IHT, ADMM ...) are summarized. The Bayesian Maximum A Posteriori (MAP) approach and its link with regularization is mentioned. The prior models which enforce sparsity are classified in four main classes:
- Heavy tailed: Double Exponential, Generalized Gaussian, Student-t, Cauchy;
- Mixture models: Finite mixture of Gaussians,
- Infinite Scaled Gaussian mixture model and its relation to Student-t and their equivalent hierarchical models with hidden variables;
- General Gauss-Markov-Potts models.
Using these priors in a Bayesian approach needs appropriate Computational tools which are summarized as: Joint Maximum A Posteriori (JMAP), MCMC and Variational Bayesian Approximation (VBA). Finally, the applications of these prior models in Inverse Problems such as X ray Computed Tomography and Microwave inverse scattering imaging systems are presented.

Biography
Ali Mohammad-Djafari received the B.Sc. degree in electrical engineering from Polytechnic of Teheran, in 1975, the diploma degree (M.Sc.) from Ecole Supérieure d’Electricité (SUPELEC), Gif sur Yvette, France, in 1977, the “Docteur-Ingénieur” (Ph.D.) degree and ”Doctorat d'Etat” in Physics, from the University of Paris Sud 11 (UPS), Orsay, France, respectively in 1981 and 1987. He was Assistant Professor at UPS for two years (1981-1983). Since 1984, he has a permanent position at “Centre national de la recherche scientifique (CNRS)” and works at “Laboratoire des signaux et systèmes (L2S)” at Centrale-Supélec. He was a visiting Associate Professor at University of Notre Dame, Indiana, USA during 1997-1998. From 1998 to 2002, he has been at the head of Signal and Image Processing division at this laboratory. Presently, he is "Directeur de recherche" and his main scientific interests are in developing new probabilistic methods based on Bayesian inference, Information Theory and Maximum Entropy approaches for Inverse Problems in general in all aspects of data processing, and more specifically in imaging and vision systems: image reconstruction, signal and image deconvolution, blind source separation, sources localization, data fusion, multi and hyper spectral image segmentation. The main application domains of his interests are Medical imaging, Computed Tomography (X rays, PET, SPECT, MRI, microwave, ultrasound and eddy current imaging) either for medical imaging or for Non Destructive Testing (NDT) in industry, multivariate and multi-dimensional data, space-time signal and image processing, data mining, clustering, classification and machine learning methods for biological or medical applications.
He has supervised more than 20 Ph.D. Thesis, more than 20 Post-doc research activities and more than 50 M.Sc. Student research projects. He has more than 60 full journal papers and more than 300 papers in national and international conferences. He has organized or co-organized more than 10 international workshops and conferences. He has been expert for a great number of French national and international projects. Since 1988 he has many teaching activities in M.Sc. and Ph.D. Level in SUPELEC, University of Paris sud, ENSTA and Ecole centrale de Paris.
## Conference events

**Monday November 28, 2016**
- Opening ceremony (14:00 – 14:30)
- Welcome reception (18:30)

**Tuesday November 29, 2016**
- Keynote 1 (09:00 – 10:00)
- Lunch (12:30 – 14:00)
- Banquet (20:30 – 23:00)

**Wednesday November 30, 2016**
- Keynote 2 (09:00 – 10:00)
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Monday November 28, 2016

14:00 – 14:30 Opening Ceremony
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Room: Aula magna
14:00 – 14:30 Opening Ceremony
18:30 Welcome Reception

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Chairs: Luigi Gallo and Giuseppe De Pietro
National Research Council, Italy

Room: Aula Magna
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Room: Aula Magna

**9:00 – 10:00 Keynote**

**Deterministic and Bayesian Sparsity enforcing models in signal and image processing**

Ali Mohammad-Djafari, Centrale-Supélec, France

Chair: Albert Dipanda

University of Bourgogne, France
Wednesday November 30, 2016 --- 10:30-12:30

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