مركز تنمية التكنولوجيات المتطورة
Centre de Développement des Technologies Avancées C.D.T.A

Has the pleasure to host

The 8th International Workshop on Systems, Signal Processing and their Applications

WOSSPA 2013

12 - 15 MAY 2013, Hotel Safir Mazafran, Zéralda, Algiers, Algeria

http://www.wosspa2013.org

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Messages

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Message from the General Chair

These Proceedings are the outcome of an event, WoSSPA'2013, held at Mazafran, Tipaza, nearby Algiers. The "Centre de Développement des Technologies Avancées" (CDTA) in Algiers was the local co-organizer and main sponsor of the event. The CDTA Director was both the main sponsor and local supervisor of the local organizing committee mainly responsible for Local Arrangements and Logistics. The main scientific and technical organizers of this event, in addition to myself (from Qatar University and University of Queensland, Australia), came from different parts of the world, including "Ecole Polytechnique" of Algiers, University of Rijeka, Croatia and many others in Canada, USA, Ireland and France with the main contributors from CDTA being the Vice-Chair and the TPC liaison.

 This meeting represented the 27th Anniversary of WoSSPA, and the second time it was hosted in an African country. This achievement followed the successful organization of ISSPA'2007, WoSPA'2008 held in Sharjah (United Arab Emirates) and WoSSPA'2011 held in Tipaza, Algeria as well as the more recent organization of ISSPA2012 in Montreal, Canada. Most earlier events in the 1980s, 90s and 2000s were held in Australia apart from a joint event organized in Malaysia in 2005. The name of the event was then WoSPA (Worshop on Signal Processing and its Applications). The word "Systems" in the title was added in the year 2011.

The technical review process for this event was both systematic and thorough. All submitted papers were reviewed by at least three independent reviewers, with some papers getting up to 8 independent reviews. We had opened 16 regular tracks and 7 special sessions for submission. We received 232 papers from which 173 papers were reviewed and 69 were withdrawn or rejected without review. From the 173 reviewed papers, 93 were accepted, and 80 rejected, resulting in an acceptance rate of 54%. The accepted papers were organized in 8 poster session and 7 oral sessions. In addition, the program was enhanced by 6 half-day Tutorial presentations and 3 Plenary presentations (see inside for details).

As for all the previous events, the technical program and Proceedings prioritized some particular topics: Biomedical Research, Signal Processing for Communications and Radar Signal Processing as well as other multi-disciplinary research. The selection of these topics is mostly driven by the needs and interests of the local Researchers as well as the hot topics in the field.

As of now, with this workshop, we will have organized four high level events (including ISSPA'2007 and WoSPA'2008, and WoSSPA'2011) in the field of Signal Processing in the Middle East & North Africa region. It was found that, local universities can make a significant leap in the field of Signal Processing should they connect with expatriate researchers working in overseas universities. To make this link productive, it was desirable to define clear objectives and efficient strategies. Organizing WoSSPA'2013 is part of this plan; it continues the same tradition of high-quality, broad international participation in all areas of Signal Processing. It strives to take advantage of local expertise to define new multi-disciplinary research directions that lead to significant innovation for the benefit of the local, Arab, African and international community at

large. In particular, local researchers participating at WoSSPA'2013 would be able to mingle freely with overseas delegates without the hassles in trying to get a visa for events organized in an overseas destination with restrictive visa requirements.

I personally thank all the contributors, and especially the international ones, for their participation to this event and hope that they benefitted from discussions through their interactions with local researchers. I am convinced that WoSSPA'2013 was profitable for all delegates and will fully contribute in promoting world standards in local research teams so as to meet the challenges ahead and helping to become some of the top notch research teams in the region. Indeed, a desired outcome of such scientific meetings is to help regional emerging countries link with cutting-edge international research conducted in more developed countries. This allows building new networks linking researchers from these different regions in new collaborations. At a more individual level, international delegates can identify opportunities available for research locally, given that the host country Algeria was, in 2013, ranked No.14 worldwide in terms of cash reserves; and local researchers will be able to establish new connections.

As the founder of both ISSPA and WoSPA, as the former founder and Director of the Signal Processing Research Centre in Australia, and former Dean of ECUoS, this event is also part of my personal strategy which is to serve the Community and ensure that my work will leave a useful legacy both internationally and locally.

This event could proceed because many colleagues teamed up to make this event successful. This included of course, the local co-organizer and main sponsor of this event, Brahim Bouzouia, Research Director and Director of CDTA, the local organization and logistics committee, the Wosspa2013 Vice-Chair and Research Director, Djamel Bouchafra, the TPC co-chairs, Adel Belouchrani and Victor Sucic, the Tutorial Chair, Karim Abed-Meraim, as well as the CDTA-TPC liaison, Amine Bouabdallah who worked tirelessly to make this event as success. In addition, the event benefitted considerably from the members of the Steering Committee who provided timely advice (Mohamed Cheriet, Abbes Amira and Sebti Foufou), the main technical Track chairs (Tiago Falk, Ervin Sejdic and Haikal El-Abed) and the long list of others, without forgetting Dr Farid and Khalida Ghanem.

I would like to thank everybody else who was involved and contributed in a way or another to the success of this event and to these Proceedings. The complete list of contributors appears in the list of Committees.

WoSSPA 2013 General Chair
Prof Boualem Boashash
School of Medicine, University of Queensland, Brisbane, Australia
Dept of Electrical Engineering, Qatar University, Doha, Qatar.

(prepared in Doha, Qatar, 2013)

Welcome Message from the Vice-Chair and TPC

Dear participants:

On behalf of the WoSSPA'2013 Technical Program Committee and Local Organization committee, we are delighted to welcome you to the Hotel Safir Mazafran, Algeria. The workshop had been held twice in Algeria and is co-organized, this time, by the "Centre de Développement des Technologies Avancées" (CDTA: www.cdta.dz), located at Baba-Hassen, Algiers, Algeria. This prominent event features the state-of-the-art in this field as well as some cutting-edge technologies that are results of this advance.

This 9th WoSSPA emphasizes research work related to selected signal processing applications. We have an average size but high quality program composed of about 100 papers spread over 7 invited oral sessions and 8 poster sessions. Authors from around the world will have the opportunity to present the significance of their research, interact and exchange with their peers during the four days allotted to the workshop. The submissions in the area of systems, signal processing and their applications are originated from 12 different countries and spread throughout the five continents. A total of 238 papers have been submitted but only 175 papers were reviewed; the others have been rejected for high similar scores. Among the reviewed papers, 93 papers were finally accepted (giving an acceptance rate of 54%).

In addition to the regular papers, the program offers 7 special sessions that address the following topics:

- Biomedical signal processing
- Signal separation and localization
- DSP for human behavior analysis
- Pattern recognition, biometrics, and machine learning
- Radar, sonar and communication signal processing
- Variational methods for image processing and computer vision
- Cognitive radio for wireless communication.

To promote WoSSPA'2013 as a significant scientific event, a whole day, the 12th of May, has been dedicated to learning through six tutorials that have been carefully selected. They are:

- "Applications of information theory to secure wireless communications", by Prof. **Jean-Yves Chouinard** and **Abdellah Berdai** (Université Laval, Québec, Canada)

• "Medical image analysis: principles and methods",
By **Prof. Abdelkrim Seghouane** (University of Melbourne, Melbourne, Australia)

• "Bayesian inference with hierarchical prior models for inverse problems in signal processing",
by **Prof Ali-Mohammad Djafari** (CNRS, Paris, France)

• "LTE (Long-Term Evolution) and beyond LTE",
by Prof. Merouane Debbah (SUPELEC, Alcatel-Lucent Chair on Flexible Radio, Paris, France)

• "Introduction to machine learning and pattern recognition"
by **Dr. Djamel Bouchaffra** (Director of Research, CDTA, Algiers, Algeria)

• "A review of wavelet denoising in medical imaging",
By **Prof. Abdeldjalil Ouahabi**, (Polytechnique-Tours, France)

In order to promote learning through effective instructional practices, these tutorials are offered for free by renowned educators and researchers in their fields.

Also, we are delighted to offer to WoSSPA'2013 attendees three plenary presentations:

• "Multimodal image fusion of anatomical structures for diagnosis, therapy planning and assistance",
by **Prof. Farida Cheriet** (Ecole Polytechnique de Montréal, Canada)

• "DSP research enhancement, ethics and medical research issues",
by **Prof. Boualem Boashash** (Qatar University, University of Queensland, Australia)

• "Sparse reconstruction using compressive sensing and its applications in signal processing",
by **Prof. Tarek Al-Naffouri** (KAUST and KFUPM, Kingdom of Saudi Arabia)

This fructuous program would be incomplete without the important contribution of many people, at their top, the General Chair, Prof Boualem Boashash. We must not forget to thank all members of the technical program committee, and the reviewers who have put forth great effort in evaluating all submitted manuscripts on time.

To make this meeting successful, a whole local team inside CDTA has worked diligently to: (i) attract various sponsors and (ii) take care of every small detail of the entire local organization of the workshop. We would like to thank Messaoud

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Bengherabi, Chair of Local Arrangements, all the members of this local team and the CDTA director who provided the logistics and financial support to make this event one of a kind.

It has been a long professional and human learning experience for all of us. All members involved in this event have interacted seamlessly in a synergetic manner by offering their best to move forward. We hereby express our sincere thanks and support to all of them.

We would like to express our profound appreciation and thanks to the sponsors who contributed to the success of this event by financially supporting WoSSPA'2013. At the top of this list, we have Milltech Smart Solutions and Algérie Telecom, our Gold sponsors. We also have Agence de Régulation des Postes et Télécommunications (ARPT) and Condor, our Silver sponsors. Finally, we are grateful to Mobilis and Agence Thématique de Recherche en Sciences & Technologie (ATRST) for their unwavering support.

Last and not least, we would like to thank our professional sponsors, IEEE, EURASIP, IEEE region 8 and IEEE Algerian Sub-Section. Enjoy the program, and most of all, have a great time.

Vice Chair
Dr. Djamel Bouchaffra
CDTA
Algiers, Algeria

TPC Co-Chair
Dr. A. Belouchrani,
ENP
Algiers, Algeria

TPC Co- Chair
Dr. V. Sucic,
University Rijeka
Croatia

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Welcome Message from the Honorary Chair

Dear WoSSPA'2013 participants,

As Honorary Chair, I would like to welcome you to this important biannual scientific event dedicated to signals, their processing and applications. The field of signal processing is of the most exciting, dynamic and decisive for scientific and technical advances in several related areas. This eighth edition of WoSSPA is hosted and co-organized by the -Centre de Développement des Technologies Avancées- (CDTA), located at Algiers.

In addition to be the Honorary Chair of WoSSPA'2013; as Director of CDTA, I also supervised the local co-organization and sponsorship of this conference with a close support of the local organizing committee. It was a long year, full of ardent and laborious preparations, but ultimately the outcome is consistent.

This eighth edition is characterized by a rich, well balanced and varied program. It has tutorials, plenary sessions, and oral and poster presentations, well shackled. I wish a warm welcome to all the participants, particularly those who came from abroad I hope you will enjoy your stay among us during the four days of the workshop.

I am convinced that WoSSPA'2013 will be very beneficial, for all the delegates, to exchange, discuss and deepen their analysis around of the most exciting themes and applications in Signal Processing.

Finally, I am very grateful to all my local colleagues who helped with the success of the local organization of this event, as a great local team made up of over twenty CDTA people. I am of course thankful to Prof Boualem Boashash, General Chairman, who was the key of the success of this event, Vice-Chair and all Chairs and members of the organizing and technical program committees, without forgetting the sponsors whether technical or financial.

Dr. Brahim Bouzouia
Research Director, CDTA Director
WoSSPA'2013 Honorary Chair

Committees

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Vice-Chair
Mohamed Cheriet (Ecole de technologie superieure (University of Quebec), Canada)
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Abdeldjalil Aïssa-El-Bey, telecom-bretagne, France
Abderezak Guessoum, Univ. Blida, Algeria
Abd-Krim Seghouane, NICTA, Australia
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Saeed Gazor, Queen's Univ, Canada
Tiago Falk, INRS, Canada
Victor Sucic, Univ Rijeka, Croatia
Yacine Chitour, LSS-Supelec, France
Youcef Remram, USTHB, Algeria

Social event

The social event consists of a visit to the Museum of El Mudjahid located at the underground of Maqam Echahid Monument (the Martyr temple), an iconic concrete monument located on the heights of Algiers that gives a beautiful panoramic view on the bay of Algiers. This museum that sits beneath the Makam Echahid, has been dedicated to collect, preserve and display objects and memories of the struggle against colonialism from 1827.

Maqam Echahid consists of three stylized fins that join mid-height and reaches a height of 92 meters (302 ft). The three massive concrete palm fronds represent the coming together of agriculture, culture and industry, the keys elements to help build the Algerian society. Above the three supporting fins at 14 meters (47 ft) from the ground, is an Islamic style turret with a diameter of 10 meters (33 ft) and a height of 7.6 meters (25 ft), topped by a dome of 6 meters (20 ft). It rests on an esplanade that burns an "eternal flame" and includes a crypt, an amphitheater and the Museum of El Mujahid (underground).
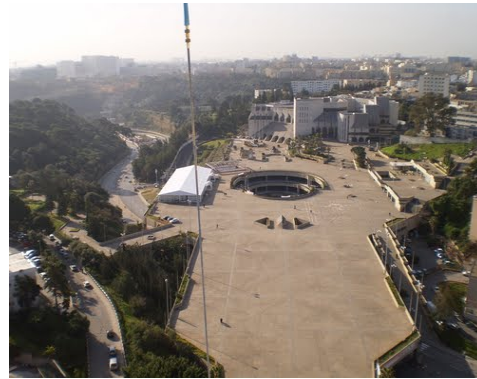
After visiting the museum and enjoying the sightseeing, the bus will take the participants through the cornice to enjoy the coast road. A dinner will close the event.

Please note that the social event will be charged. The cost will be determined depending on the number of subscriptions. Registration to the event will be available on-site.

Tutorials

Tutorial 1

Date: Sunday, 12th May 2013

Time: 09:00 – 12:15

Applications of Information Theory to Secure Wireless Communications

Professors Jean-Yves Chouinard and Abdellah Berdai, (Université Laval, Québec-Canada, Canada)

Abstract

Wireless channels and networks are particularly vulnerable to attacks and treats. This tutorial introduces information-theoretical channel models and presents methods to ensure the integrity of transmitted information and prevent information leaks.

Since its introduction by Shannon, the ubiquitous principles information theory have been successfully applied to large variety of scientific domains including communications, error control coding, cryptography, source coding, mathematics, physics, biology, etc. In this tutorial, applications of information theory to practical problems of secrecy and authentication over wireless channels and networks will be presented. First, the context of secure and robust communications over physical wireless channels will be exposed. This will be followed by an overview of the relevant principles of information theory leading to the definition of information-theoretic measures in wiretap channels. Concepts of secret capacity and rate-equivocation will be presented first for simple two-way Gaussian channels and then extended to multi-user channels. Encryption and authentication methods will be revisited in the context of wireless channels along with error control coding schemes, to ensure the legitimacy and protect the confidentiality of information transmitted over channels vulnerable to passive and active threats. Protection against jamming and secure network coding will be also addressed in this tutorial.

Biography

Jean-Yves Chouinard is a professor with the Department of Electrical and Computer Engineering at Laval University, Canada. He is the author/co-author of close to 200 journal, conference papers and technical reports. He is co-recipient of

the 1999 Neal Shepherd Best Propagation Paper Award (IEEE Vehicular Society) and the 2004 Signal Processing Best Paper Award (European Journal of Signal Processing). He is co-author of book chapters on software reconfigurable MIMO wireless communication systems and on OFDM-based mobile broadcasting and co-editor of a book on information theory. He is an Associate Editor for the IEEE Transactions on Vehicular Technology and for the IEEE Transactions on Broadcasting. He has served as a Technical Program Co-chair for the 2012 Vehicular Technology Conference (VTC'2012 Fall), Publications Chair for the IEEE International Symposium on Information Theory (ISIT'2008) and General Co-chair for the Canadian Workshop on Information Theory (CWIT'95). His research interests are signal processing, communications theory and applications, broadband wireless systems, and secure communication networks.

Abdellah Berdai received the Engineer degree from the National School of Engineers (ENITA) Algeria in 1998. From 1998 to 2004, he worked as an engineer responsible for radio networks monitoring. He received the Master degree in 2006 and the Ph.D. degree in 2011 from Laval University, Quebec city. Since 2012 is professor at the Department of Electrical and Computer Engineering at the Ecole Militaire Polytechnique (EMP), Alger, Algeria. He is the author or co-author of 10 journal, conference papers and technical reports. He has supervised several PGS and Engineer students. His research interests are in signal processing, turbo detection over selective channels, communications theory and applications, and radar for military applications.

Tutorial 2

Date: Sunday, 12th May 2013

Date: Sunday, 12th May 2013

Time: 09:00 – 12:15

Medical image analysis: principles and methods

A/Professor Abdelkrim Seghouane, (University of Melbourne, Australia)

Abstract
The increasing use of different imaging modalities and modern imaging methods in clinical medicine has gradually changed traditional medical diagnosis. Modern medical imaging has moved away from the production of qualitative static photographs of anatomy towards the generation and use of critical medical

information extracted from digitized images and signals. This tutorial introduces the principles of medical imaging technologies such as X-ray, ultrasound, MRI and PET. It presents mathematical and statistical techniques used in the field of medical image analysis with a focus on computer implementation. Algorithms and strategies based on the use of various models to solve the following medical imaging problems: image enhancement (for improving the visibility of significant structures), image segmentation and pattern recognition (for localization and identification of target structures), image reconstruction (for three-dimensional image formation) and image registration (to determine the correspondence of multiple images of the same anatomical structure); will be studied.

The tutorial is divided into two parts. In the first part, we will present the principles underlying X-ray, PET and SPECT, NMR and MRI and ultrasound imaging. We will also discuss the problems encounted in each of these imaging modalities to extract the medical information.

The second part of the tutorial is devoted to the description of some methods used to resolve the problems of image enhancement, image segmentation and pattern recognition, image reconstruction and image registration.

Biography
Abd-krim Seghouane is a Senior Researcher at National ICT Australia (NICTA), Canberra Research Laboratory. He received a Ph.D. in Control and Signal Processing from Université Paris sud in 2003. He has been with NICTA since 2004, prior to that he was a postdoctoral fellow at INRIA Rocquencourt. His main research interest is in statistical signal processing with application to biomedical engineering.

Tutorial 3

Date: Sunday, 12th May 2013

Time: 09:00 – 12:15

Bayesian inference with hierarchical prior models for inverse problems in imaging systems

Professor Ali Mohammad-Djafari, (Orsay University, France)

Abstract

Simple prior laws (Gaussian, Generalized Gaussian, Gauss-Markov and more general Markovian priors) are nowadays common in modeling and in their use in Bayesian inference methods. But, we need still more appropriate prior models which can account for the presence of the contours and homogeneous regions. Recently, we proposed a family of hierarchical prior models, called Gauss-Markov-Potts, which seems to be more appropriate for many applications in Imaging systems such as X ray Computed Tomography (CT) or Microwave imaging in Non-Destructive Testing (NDT).

In this presentation, first I will present this family of prior models, then show how to use them in practical CT or other imaging systems and show some results in 2D and 3D.

Biography

Ali Mohammad-Djafari received the B.Sc. degree in electrical engineering from Polytechnique of Teheran, in 1975, the diploma degree (M.Sc.) from Ecole Supérieure d'Electricit(SUPELEC), Gif sur Yvette, France, in 1977 and 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 Associate 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 SUPELEC. 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: image reconstruction, signal and image deconvolution, blind source separation, source localization, data fusion, multi and hyper spectral image segmentation. The main application domains of his interests are 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, signal and image processing, data mining, clustering, classification and machine learning methods for biological or medical applications.

He has supervised more than fifty M.Sc. research projects, more than 15 Ph.D. thesis and more than 10 Post-doc research activities. In 2012, he was supervising 6 Ph.D. thesis. He has more than 40 full journal papers and more than 200 papers in national and international conferences. He has organized or co-organized about 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 and University of Paris sud.

He also participated and managed many industrial contracts with many French national industries such as EDF and Thales or R & D great institutions such as CEA and INSERM as well as the regional (such as Digiteo), national (such as ANR) and European projects (such as ERASYSBIO).

Tutorial 4

Date: Sunday, 12th May 2013

Time: 13:45 – 17:00

LTE and beyond LTE.

Professor Merouane Debbah, (Alcatel-Lucent Chair on Flexible Radio, SUPELEC, France)

Abstract
Next generation wireless communication systems (LTE and LTE advanced) are based on a new multiple access technique called OFDMA and a multiple antenna architecture which increases drastically the rate. Many deployments of this technology are actually taking place around the world with a complementary co-existence with other technologies such as 3G, 2G or Wi-Fi. As a consequence, it is of major importance to understand the pros and cons of LTE as well as its impact on the different services provided to users (voice as well as data). The goal of this tutorial is to provide the fundamentals of LTE with a clear understanding of its impacts in heterogeneous networks (Femto-cells, small cells and macrocells).

Biography
Mérouane Debbah entered the Ecole Normale Supérieure de Cachan (France) in 1996 where he received his M.Sc and Ph.D. degrees respectively. He worked for Motorola Labs (Saclay, France) from 1999-2002 and the Vienna Research Center for Telecommunications (Vienna, Austria) until 2003. He then joined the Mobile Communications department of the Institut Eurecom (Sophia Antipolis, France) as an Assistant Professor until 2007. He is now a Full Professor at Supelec (Gif-sur-Yvette, France), holder of the Alcatel-Lucent Chair on Flexible Radio and a recipient of the ERC starting grant MORE (Advanced Mathematical Tools for Complex Network Engineering). His research interests are in information theory, signal processing and wireless communications. He is a senior area editor for IEEE Transactions on Signal Processing. Mérouane Debbah is the recipient of the "Mario Boella" award in 2005, the 2007 General Symposium IEEE GLOBECOM

best paper award, the Wi-Opt 2009 best paper award, the 2010 Newcom++ best paper award as well as the Valuetools 2007, Valuetools 2008, Valuetools 2012 and CrownCom2009 best student paper awards. He is a WWRF fellow. In 2011, he received the IEEE Glavieux Prize Award.

Tutorial 5

Date: Sunday, 12ᵗʰ May 2013

Time: 13:45 – 17:00

A Review of Wavelet Denoising in Medical Imaging

Professor Abdeldjalil Ouahabi, (Polytechnique-Tours, France)

Abstract
Medical images, e.g. obtained from MRI, are the most common tool for diagnosis in medical field. These images are often affected by random noise arising in the image acquisition process, measurement and transmission. The resolution of this problem may lead to improved diagnosis and surgical procedures. Noise removal is essential in medical imaging applications in order to enhance and recover fine details that may be hidden in the data.

A common approach for image denoising is to convert the noisy image into a transform domain such as the wavelet (and/or contourlet) domain, and then compare the transform coefficients with a fixed or adapted threshold. The wavelet representation naturally compresses the essential information in a signal into relatively few, large coefficients, which represent image details at different resolution scales.

In general, image denoising using wavelet-based multiresolution analysis imposes a compromise between noise reduction and preserving significant image details.
In this tutorial, we review recent wavelet denoising techniques for medical ultrasound and for magnetic resonance images, evaluate their implementation via MATLAB package and discuss their performances in terms of SNR (signal-to-noise ratio) or PSNR (peak signal-to-noise ratio) and visual aspects of image quality. However, image denoising using wavelet-based multi-resolution analysis requires a delicate compromise between noise reduction and preserving significant image details. Hence, some subtleties associated with these denoising techniques will be explained in detail.

Biography

Since September 1995, Abdeldjalil Ouahabi is Professor at Polytech'Tours (Tours University- France), and Director of Polytech'Tours's Signal & Image Group. He received Ph.D. and the State Doctorat (Doctorat d'état) degrees in Electrical Engineering in 1983 and 1992, respectively, from the National Polytechnic Institute of Grenoble, France. His main research area is image and signal processing.

He has a strong interest in sampling theories multiresolution algorithms, optimal filtering, spectral analysis, wavelets, and the use of fractals for image processing. He is the author of over 120 published papers in these areas.

He was the Head of the Electrical Engineering Institute at USTHB-Algiers (1990-1994) and Head of the International Relations at Polytech'Tours (2004-2010). He is also the founder of Systems and Signals Laboratory at Algiers in 1992. He is Member of the Board of Polytech'Tours (2002-2012) and was Member of the Board of Studies and University Life (CEVU) of the University of Tours (2009-2012).

Prof. Abdeldjalil Ouahabi has acted as expert and scientific advisor to the EU, the UNESCO, the Ministry of Higher Education and Research and the Ministry of Foreign and European Affairs of France, the Ministry of Higher Education and Research of Algeria.
He has organised and chaired a large number of International Conferences including the International Conference on Signals and Systems, ICSS'94, held in Algiers in 1994 and the Club EEA Congress which is held in Tours (France) in 2009. He also served as Editor or Guest Editor for several journals or books including « Analog Integrated Circuit and Signal Processing » (Springer 2010-2011), Hermès-Lavoisier editions (2012) and ISTE -Wiley editions (2012).

Tutorial 6

Date: Sunday, 12th May 2013

Time: 13:45 – 17:00

Machine Learning and Pattern Recognition

Dr. Djamel Bouchaffra (Director of Research, CDTA)

Abstract
This tutorial provides an in-depth analysis of some important issues within the field of Machine Learning and Pattern Recognition. It reflects recent developments while providing a comprehensive introduction to some fundamental issues pertaining to

the fields of machine learning and pattern recognition. It targets advanced undergraduates or first year Ph.D. students as well as researchers and practitioners. It focuses on deepening current understanding of the underneath mathematical models when applied to real world applications.

Biography

Djamel Bouchaffra received the Ph.D. degree in Computer Science from Grenoble University, France. He currently holds the title of Director of Research. In 2012, he joined the Center for Development of Advanced Technology, Algeria and in January 2013 he was appointed Head of the Division "Systems Architecture and Multimedia" (aka ASM). Prior to this appointment, Dr. Bouchaffra was a Professor of Computer Science at the Department of Mathematics and Computer Science, Grambling State University, LA. He was a Senior Lead Researcher at the Center of Excellence for Document Analysis and Recognition (CEDAR) at the University of New York, Buffalo. Prior to this appointment, Dr. Bouchaffra was an Assistant Professor at Oakland University, Michigan. He is currently working on mathematical models that embed discrete structures into a Euclidean space or a Riemannian manifold and merge topology with statistics for a classification or a regression task. He introduced the structural and the topological hidden Markov models. He has written several papers in peer-reviewed conference proceedings and premier journals, such as the IEEE Transactions on Pattern Analysis and Machine Intelligence and Pattern Recognition. His current research interests include pattern recognition, machine learning, computer vision, and artificial intelligence. Dr. Bouchaffra was the lead Guest Editor of a special issue in the journal of Pattern Recognition titled "Feature Extraction and Machine Learning for Robust Multimodal Biometrics, published by Elsevier." He is an Editorial Board Member of several journals, such as Pattern Recognition (Elsevier), and Advances in Artificial Intelligence (Hindawi). He chaired several sessions in conferences. He is on the review panels of governmental funding agencies, such as NASA (Galaxy Classification) and EPSRC, U.K. He is an IEEE senior Member and a member of the IEEE Computer Society.

Plenary Sessions

Plenary Session 1

Date: Monday, 13th May 2013
Time: 09:00 – 09:45

Multimodal Image Fusion of Anatomical Structures for Diagnosis, Therapy Planning and Assistance

Professor Farida Cheriet (Ecole Polytechnique de Montréal, Canada).

Abstract

This plenary provides an in-depth analysis of some important issues within the field of Multimodal Medical Image Fusion. Imaging systems of Anatomical structures have known a wide evolution over the past decade and provide several measurable parameters with potential to quantify morphological and functional abnormalities.

Unfortunately, some imaging modalities provide functional content which is complementary to the structural content provided by other modalities. Magnetic resonance imaging (MRI) and single photon emission computed tomography (SPECT) are often used to assess myocardial viability while multi-detector tomography (MDCT) and fluoroscopy are used to assess the coronary and ventricle morphology even though a sequence of fluoroscopic images contains implicitly information about the contractility of the epicardium. Our team is currently working on the development of clinical tools for the visualization and interactive manipulation of cardiac structures from fusion of 3D and (2D + t) images obtained from different modalities such as MDCT, MRI, and fluoroscopic imaging systems.
Over the last decade, our team has also focused on the 3D assessment of the deformity of the spine in patients with scoliosis. Consequently, several stereo radiographic reconstruction techniques have been proposed, varying mainly in terms of calibration method, X-ray configuration, reconstruction

primitives and algorithms. All these different techniques provide a 3D model of the spine, according to which several 3D clinical parameters are computed and used for diagnosis, follow-up or correction assessment of the spinal deformity. A complete geometric model of the trunk can be obtained from multimodal fusion of MRI, X-ray and topographic images of the trunk. The geometric model can also be combined with mechanical properties of the bone structures and soft tissue to build a biomechanical model of the trunk that can be used, for example, in treatment simulations.

Biography

Farida Cheriet received the B.Sc. degree in computer science from the University USTHB, Algiers, in 1984, the D.E.A. degree in the field of languages, algorithms and programming from the University of Paris VI, France, in 1986, and the Ph.D. degree in computer science from the University of Montreal, QC, Canada, in 1996. She held a postdoctoral position at the Biomedical Engineering Institute, École Polytechnique de Montréal, from 1997 to 1999. Since 1999, she has been appointed in the Department of Computer and Software Engineering, École Polytechnique de Montréal, where she is currently a full Professor. Her research interests include, three–dimensional (3-D) reconstruction of bone structures from X-rays, calibration of X-ray imaging systems, non-invasive 3-D modeling of scoliosis deformities, 3-D Augmented Reality systems for minimally invasive surgery, 3-D reconstruction and visualization of vascular structures from multimodal images and spatio-temporal registration of medical images.

Plenary Session 2

Date: Tuesday, 14th May 2013

Time: 09:00 – 09:45

Sparse Reconstruction using Compressive Sensing and its Applications in Signal Processing

A/Professor Tarek Al-Naffouri, King Abdullah University of Science and Technology (KAUST), KSA

Abstract:

There has been increased interest in sparse signal reconstruction algorithms (commonly known as compressed sensing) due to their wide applicability in various fields. Recently, focus has shifted to Bayesian based approaches that are able to perform sparse recovery at much lower complexity while invoking constraint and/or a priori information about the data.

In this talk we will give a quick overview of sparsity recovery algorithms with special focus on the Bayesian-based ones. We will also present a newly proposed Bayesian algorithm which is able to deal with sparse signals with non-Gaussian or unknown distributions. The talk will also introduce variants of this algorithm that deal with various sparsity structures. These include algorithms for 1) estimation of block-sparse signals 2) recovery of signals that share the same spasrity pattern and 3) distributed estimation of sparse signals. The discussion will be illuminated with applications from signal processing, communications, biomedical, and seismic deconvolution.

Biography

Tareq Y. Al-Naffouri received the B.S. degrees in mathematics and electrical engineering (with first honors) from King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia, in 1995, the M.S. degree in electrical engineering from Georgia Institute of Technology, Atlanta, in 1998, and the Ph.D. degree in electrical engineering from Stanford University, CA, in 2004. He was a visiting scholar at the California Institute of Technology, Pasadena, from January to August 2005 and during summer 2006. He was a Fulbright Scholar at the University of Southern California from February to September 2008. He is currently an Associate Professor at the Electrical Engineering Department at King Abdullah University of Science & Technology (KAUST) and jointly at King Fahd University of Petroleum and Minerals (KFUPM), Saudi Arabia.

His research interests lie in the areas of adaptive and statistical signal processing and in compressed sensing and their applications to wireless communications, and in multiuser information theory. He has over 65 publications in journal and conference proceedings, nine standard contributions, and five issued patent and three pending. Dr. Al-Naffouri is the recipient of a 2001 Best Student Paper Award at the IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing (NSIP) 2001 for his work on adaptive filtering analysis, the IEEE Education Society Chapter Achievement Award in 2008, and Al-Marai Award for innovative research in communication in 2009.

Plenary Session 3

Date: Wednesday, 15th May 2013

Time: 09:00 – 09:45

DSP Research enhancement, Ethics & Medical research issues

Professor Boualem Boashash (Qatar University & University of Queensland, Australia)

Abstract:
What does success mean? How to reach it? Almost every scholar, researcher or academic would like to succeed in his/her career whether they are still PhD students, Postdoctoral Research Fellows, permanent faculty or full-time researchers.
This presentation will first address the subject in terms of what it actually means to succeed in terms of criteria and respect of ethical constraints and professional constraints. It will then present a list of basic rules that should be followed so as to reach the desired success and avoid major failures.
Finally, examples of projects will be given that help take the road to success with a focus on Biomedical Signal Processing.

Biography
Boualem Boashash (IEEE Fellow '99') is a Scholar, Professor and Senior Academic Manager with experience in 5 leading Universities in France and Australia. He has published over 500 technical publications, including over 100 journal papers, 3 books and 3 text-books covering Engineering, Applied Mathematics and Medicine. He was one of the early pioneers of the field of Time–Frequency Signal Processing and he is currently working on medical applications covering newborn EEG analysis as well as ECG, HRV and fetal movements for improving health outcomes . Among many initiatives, he founded ISSPA, a leading conference since 1985 and its sister workshop WOSSPA. He was the Dean of Engineering at the University of Sharjah, UAE, (2006-2009) and the Foundation Professor and Director of the Signal Processing Research Centre at the Queensland University of Technology, Brisbane, Australia (1991-2005). In addition to the teaching, research and admin experience in universities in France and Australia, as well as 2 universities in UAE and Qatar, he also had 3 years industrial experience with Elf-Aquitaine in France at the beginning of his career. He is currently Professor at Qatar University, Dept of EE, and the leader of a biomedical signal processing group at the School of Medicine, University of Queensland, Brisbane, Australia. His work has been cited about 9000 times (Source: Google Scholar).

Workshop Program at a Glance

Time	Ilizi	Casbah	Tipaza
Sunday, May 12			
09:00	T2: Medical image analysis: principles and methods	T1: Applications of Information Theory to Secure Wireless Communications	T3: Bayesian inference with hierarchical prior models for inverse problems in Signal Processing
12:15	Lunch		
13:45	T6: A review of wavelet denoising in medical imaging	T4: LTE and beyond LTE.	T5: Machine Learning and Pattern Recognition
18:15	OC: Offical Opening Ceremony		
19:15	Dinner		

Time	Casbah	Tipaza
Monday, May 13		
08:30	Asbly: Assembly	
08:45	Intro: Introductions	
09:00	PI 1: Multimodal Image Fusion of Anatomical Structures for Diagnosis, Therapy Planning and Assistance	
09:45	Q&A: Q&A, discussion	
10:00	SS-SSL: Special Session on "Signal separation and localization "	SS-IPCV: Special Session on "Variational methods for image processing & computer vision"
11:20	Coffee Break	
11:50	P1: Biomedical Signal Classification	P2: Image and Video Processing
13:00	Lunch	
14:15	SS-BSP: Special Session on "Biomedical signal processing"	SS-HBA: Special Session on "DSP for humans behavior analysis"
15:35	Coffee Break	
16:00	P3: Biomedical Signal Processing	P4: Biometrics Systems and

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		Security

Tuesday, May 14

Time	Casbah	Tipaza
08:30	Assembly	
08:45	Intro: Introductions	
09:00	PI 2: Sparse reconstruction using compressive sensing and its applications in signal processing	
09:45	Q&A: Q&A, discussion	
10:00	SS-PRBML: Special Session on "Pattern recognition, biometrics, and machine learning"	SS-RSCSP: Special Session on "Radar, sonar and communication signal processing"
11:20	Coffee Break	
11:50	P5: Pattern Recognition	P6: Signal Detection and Estimation
13:00	Lunch	
14:00	**SE: Social Event**	

Wednesday, May 15

Time	Casbah	Tipaza
08:30	Assembly	
08:45	Intro: Introductions	
09:00	PI 3: DSP Research enhancement, Ethics & Medical research issues	
09:45	Q&A: Q&A, discussion	
10:00	SS-CRWC: Special Session on "Cognitive radio for wireless communications"	
11:50	P7: Wireless Communications & signal processing	P8: Satellite Communications & signal processing
13:00	Lunch	

Technical Program

Sunday, May 12

09:00 - 12:15

T1: Applications of Information Theory to Secure Wireless Communications

Tutorial
Professors Jean-Yves Chouinard and Abdellah Berdai, (Université Laval, Québec-Canada, Canada)
Room: Casbah
Chairs: Berdai Abdellah (Université Laval - Québec-Canada, Canada), Jean-Yves Chouinard (Laval University, Canada)

T2: Medical image analysis: principles and methods

Tutorial
A/Professor Abdelkrim Seghouane, (University of Melbourne, Australia)
Room: Ilizi
Chair: Abd-krim Seghouane (Australian National University, Australia)

T3: Bayesian inference with hierarchical prior models for inverse problems in Signal Processing

Tutorial
Professor Ali Djafari, (Supelec, France)
Room: Tipaza
Chair: Ali Djafari (SUPELE France)

12:15 - 13:45

Lunch

13:45 - 17:00

T4: LTE and beyond LTE.

Tutorial
Professor Mérouane Debbah, (Alcatel-Lucent Chair, SUPELEC, France)
Room: Casbah
Chair: Mérouane Debbah (Supelec, France)

T5: A review of wavelet denoising in medical imaging.

Tutorial
Professor Abdeldjalil Ouahabi, (Polytechnique-Tours, France)
Room: Ilizi
Chair: Abdeldjalil Ouahabi (Polytech Tours, France)

T6: Machine Learning and Pattern Recognition

Tutorial
Dr. Djamel Bouchaffra (Director of Research, CDTA)
Room: Tipaza
Chair: Djamel Bouchaffra (CDTA, Algeria)

18:15 - 19:15

OC: Official Opening Ceremony

Chair: Boualem Boashash (Qatar University, Doha & University of Queensland, Brisbane, Australia).
Co-Chair: Brahim Bouzouia, CDTA

Guest Speaker: Dr Djamel Bouchaffra, Head, CDTA ASM Division; and TBA

Master Ceremony: Mohamed Cheriet (Ecole de Technologie Supérieure, Montreal, Canada)

19:15 - 20:45

Dinner

Monday, May 13

08:30 - 08:45

Asbly: Assembly

08:45 - 09:00

Intro: Introductions

09:00 - 09:45

PI 1: Multimodal Image Fusion of Anatomical Structures for Diagnosis, Therapy Planning and Assistance

Plenary
Professor Farida Cheriet (Ecole Polytechnique de Montréal, Canada).
Chair: Boualem Boashash (Qatar University, Doha & University of Queensland, Brisbane, Australia)

09:45 - 10:00

Q&A: Q&A, discussion

10:00 - 11:20

SS-SSL: Special Session on "Signal separation and localization"

Room: Casbah
Chair: Karim Abed-Meraim (Telecom ParisTech, France)

10:00 **A Robust Geometrical Method For Blind Separation of Noisy Mixtures of Non- Negative Sources**
Wendyam Serge Boris Ouedraogo (GIPSA-lab & Grenoble INP, France); Antoine Souloumiac (CEA, LIST, Laboratoire Outils pour l'Analyse de Données, France); Meriem Jaidane (National Engineering School of Tunis, Tunisia); Christian Jutten (GIPSA-Lab, France)

10:20 **Blind unmixing of remote sensing data with some pure pixels: Extension and comparison of spatial methods exploiting sparsity and nonnegativity properties**
Moussa Sofiane Karoui (Centre des Techniques Spatiales, Algeria); Yannick Deville (University of Toulouse, France); Shahram Hosseini (University of Toulouse / CNRS / IRAP, France); Ouamri Abdelaziz (Université des Sciences et de la Technologie d'Oran, Algeria)

10:40 **Comparative performance analysis of non orthogonal joint Diagonalization algorithms**

Mesloub Ammar (Polytchnic Military School, Algeria); Karim Abed-Meraim (Dept TSI, Télécom Paris & University of Sharjah, UAE, France); Adel Belouchrani (Ecole Nationale Polythechnique, Algiers, Algeria)

11:00 **UWB-based Elliptical Target Localization in an Indoor Environment**
Oladimeji Onalaja (London South Bank University, United Kingdom); Mohammad Ghavami (London South Bank University, United Kingdom); Mounir Adjrad (London South Bank University, United Kingdom)

SS-IPCV: Special Session on "Variational methods for image processing & computer vision"

Room: Tipaza

Chair: Abdelmalik Taleb-Ahmed (Universit of Valenciennes and Hainaut Cambrésis & LAMIH UMR CNRS 8201 UVHC, France)

10:00 **Tensor Estimation and Visualization using dMRI**
Dalila Cherifi (Université de Boumerdes, Algeria); Chellouche Ali (University of BOUMERDES, Algeria); Ait ouakli Amazigh Amazigh (IGEE, France); Benamara Youcef (University of BOUMERDES, Algeria); Deriche Rachid (Sophia Antipolis INRIA, Algeria)

10:20 **Performance Comparison of Active Contour Level Set methods in Image Segmentation**
Mourad Oussalah (University of Birmingham, United Kingdom)

10:40 **A video based real-time vehicle counting system using optimized virtual loop method**
Mamatjan Tursun (XinJiang University, P.R. China); Guzalnur Amrulla (XinJiang University, P.R. China)

11:00 **An Object Detection Technique for Very High Resolution Remote Sensing Images**
Thomas Moranduzzo (University of Trento, Italy); Farid Melgani (University of Trento, Italy); Abdelhamid Daamouche (University of Boumerdes, Algeria)

11:20 - 11:40

Coffee Break

11:50 - 13:00

P1: Biomedical Signal Classification

Room: Casbah
Chair: Abdeldjalil Ouahabi (Polytech Tours, France)

Empirical Mode Decomposition Based Support Vector Machines For Microemboli Classification
Karim Ferroudji (Electronics Department, University of Batna & Design and Implementation of Intelligent Machines, Centre de Développement des Technologies Avancées, Algeria)

Detection of Some Heart Diseases using Fractal Dimension and Chaos Theory
Ibticeme Sedjelmaci (University of Aboubekr Belkaid Tlemcen, Algeria); Fethi Bereksi Reguig (Genie-Biomedical Laboratory (GBM), University of Aboubekr Belkaid, Algeria)

Toward an adaptive extraction method of masses in digitized mammograms
Ahlem Melouah (Guelma University Labo LIAG, Algeria)

Public Software: TomoJ, eTomo and Tomtoolbox for STEM and EFTEM Tomography of Biological Samples
Zoubeida Messali (University of M'sila, Algeria)

Temporal signatures of electrodermal activity for the evaluation of runners' performance: start and finish phases
Nadia Khalfa (Ecole Nationale d'Ingénieurs de Tunis, Tunisia); Raja Ghozi (University of Tunis El-Manar, Tunisia); Meriem Jaidane (National Engineering School of Tunis, Tunisia); Slaheddine Drissi (ISSEP and OPS, Tunisia)

Multifractal analysis by the large deviation spectrum to detect osteoporosis
Mohamed Khider (USTHB, Algeria)

Kernel Based Classifiers Fusion With Features Diversity For Breast Masses Classification
Nabiha Azizi (Badji Mokhtar University of Annaba, Algeria); Yamina Tlili (Badji Mokhtar University, Algeria); Nawel Zemmal (Badji Mokhtar University, Algeria); Farah Nadir (Université Badji Mokhtar, Canada)

P2: Image and Video Processing

Room: Tipaza
Chair: Dalila Cherifi (Université de Boumerdes, Algeria)

Stereo Image Coding: State of the Art
Samira Ouddane (University of Oran, Algeria); Sid Ahmed Fezza (University of Oran, Algeria); Kamel Mohamed Faraoun (Djillali Liabes University, Algeria)

A Quality Measure Based Stopping Criterion For Iterative Deblurring Algorithms
Fatma Kerouh (USTHB, Algeria)

Contextual Adaptive Particle Filtering for Robust Real-time Non-Rigid Object Tracking
Fouad Bousetouane (Lase-laboratory & Badji Mokhtar University, Algeria); Cina Motamed (LISIC-Lab, France); Lynda Dib (Lase-laboratory, Algeria)

New Paradigm For Recognition Of Aggressive Human Behavior Based On Bag-Of-Features And Skeleton Graph
Abdelhak Ouanane (USTHB, Algeria); Amina Serir (USTHB, Algeria)

Hybrid Chaos-Based Image Encryption Approach Using Block and Stream Ciphers
Djamal Eddine Goumidi (University of Constantine, Algeria); Fella Hachouf (Constantine, Algeria)

Stereo Vision IP Design For FPGA Implementation Of Obstacle Detection System
Hamza Bendaoudi (Université Abou Bekr Belakaid de Tlemcen, Algeria); Abdelhakim Khouas (Faculté des Sciences, Université de Boumerdès, Algeria)

Driver Drowsiness Detection System
Belal Alshaqaqi (University of Science and Technology ORAN- Mohamed Boudiaf, Algeria); Amine Ouis (USTO, Algeria); Abdullah Salem Baquhaizel (University of Science and Technology of Oran, Algeria); Meriem Boumehed (University of Science and Technology ORAN- Mohamed Boudiaf, Algeria)

Double image encryption based on the reciprocal-orthogonal parametric transform and chaotic maps
Seif Eddine Azoug (Ferhat Abbas University & Laboratoire de Croissance et Caractérisation de Nouveaux Semi-conducteurs (LCCNS), Algeria); Saad Bouguezel (Unversity Ferhat Abbas-Setif- 1, Algeria)

13:00 - 14:00

Lunch

14:15 - 15:35

SS-BSP: Special Session on "Biomedical signal processing"

Room: Casbah
Chair: Farida Cheriet (Université de Montréal, Canada)

14:15 Assessing the propagation of EEG transient activity

Christian O'Reilly (Hôpital du Sacré-Coeur de Montréal, Canada); Tore Nielsen (Hôpital du Sacré-Coeur de Montréal, Canada)

14:35 Premature ventricular contraction arrhythmia detection using wavelet coefficients
Mourad Adnane (Ecole Nationale Polytechnique d'Alger, Algeria); Adel Belouchrani (Ecole Nationale Polythechnique, Algiers, Algeria)

14:55 Classification of Heart Sound Basedon Multipoint Auscultation System
Sh-Hussain Salleh (Universiti Teknologi Malaysia, Malaysia); Kamarulafizam Ismail (Universiti Teknologi Malaysia, Malaysia); Hadrina Sh-Hussain (Universiti Teknologi Malaysia, Malaysia); Arief Ruhullah Harris (Universiti Teknologi Malaysia, Malaysia); Alias Mohd Noor (Universiti Teknologi Malaysia, Malaysia); Hamed Oemar (Universiti Teknologi Mara, Malaysia); Khalid Yusoff (UITM, Malaysia)

15:15 A dielectrophoresis and image processing based system for loading single-neurons per micro-well in planar microelectrode arrays
Fadi Jaber (Qatar University, Qatar); Fatima Labeed (University of Surrey, United Kingdom); Michael Hughes (University of Surrey, United Kingdom)

SS-HBA: Special Session on "DSP for human behavior analysis"

Room: Tipaza
Chairs: Najim Dehak (Massachusetts Institute of Technology, USA), Abdenour Hadid (University of Oulu, Finland)

14:15 Automatic Understanding of Human Behavior in Videos: A review
Morad Bouzegza (Imam University, Saudi Arabia); Mohamed Elarbi-Boudihir (Imam University, Saudi Arabia)

14:35 An Effective Segmentation of Moving Objects by a Novel Local Regions-Based Level Set
Meriem Boumehed (University of Science and Technology ORAN- Mohamed Boudiaf, Algeria); Belal Alshaqaqi (University of Science and Technology of Oran, Algeria); Amine Ouis (USTO, Algeria); Abdullah Salem Baquhaizel (University of Science and Technology of Oran, Algeria); Ouamri Abdelaziz (Université des Sciences et de la Technologie d'Oran, Algeria); Keche Mokhtar (Université des Sciences et de la Technologie, B.P 1505, Oran El Mnouar, Algeria)

14:55 Adaptive edge detection using ant colony
Karima Benhamza (LABSTIC University 8 Mai 1945 GUELMA, Algeria); Hocine Merabti (Mrabti@labstic.net, Algeria); Hamid Seridi (LabSTIC, University of 8 Mai 45 Guelma, Algeria)

15:15 Vision-Based Approach for People Trackin sing Gait in Distributed and Automated Visual Surveillance

Imed Bouchrika (University of Souk-Ahras, Algeria); A Bekhouch (Uni. Of Souk-Ahras, Algeria); Abdelkrim Amirat (LINA Laboratory, University of Nantes, France)

15:35 - 16:00

Coffee Break

16:00 - 17:10

P3: Biomedical Signal Processing

Room: Casbah
Chair: Fadi Jaber (Qatar University, Qatar)

Detection of epileptics during seizure free periods
Mohamed Amine Hadj-Youcef (Ecole Nationale Polytechnique, Algeria); Mourad Adnane (Ecole Nationale Polytechnique d'Alger, Algeria); Assya Bousbia-Salah (University of Sciences and Technology Houari Boumédiène (USTHB), Algeria)

An ECG Intelligent Monitoring System with MSP430 Microcontroller
Yan Zhang (Lanzhou University, P.R. China); Yi Tian (School of Information Science and Engineering Lanzhou University, P.R. China); Zhaobin Wang (Lanzhou University, P.R. China); Yide Ma (Lanzhou University, P.R. China); Yurun Ma (Lanzhou University, P.R. China)

BEMD-Unsharp Masking for Retinal Angiography Image Sharpening
Badreddine Bouledjfane (LERICA Badji Mokhtar University, Algeria); Layachi Bennacer (LERICA Badji Mokhtar University Annaba, Algeria); Mohamed Salim Kahli (Ophthalmology Service CHU Annaba, Algeria)

Hardware Implementation of MFCC Feature Extraction for Respiratory Sounds Analysis
Mohammed Bahoura (University of Quebec at Rimouski, Canada); Hassan Ezzaidi (Universite of Quebec at Chicoutimi, Canada)

A USB based data acquisition system for EMG signal recording
Samir Boukhenous (Houari Boumediene University, Algeria); Mokhtar Attari (Houari Boumediene University, Algeria); Remram Youcef (University of Science and Technology Houari Boumediene, Algeria); Nacéra Méziane (University of Wisconsin-Madison, Madison, Algeria)

Heart sounds analysis using wavelets resposes and support vector machines
Mawloud Guermoui (University of Batna, Algeria)

Recognition Of Diabetes Disease Using A New Hybrid Learning Algorithm For Nefclass
Mostafa El Habib Daho (Biomedical Engineering Laboratory, Tlemcen University, Algeria); Nesma Settouti (Biomedical Engineering Laboratory, Tlemcen University, Algeria); Amine Lazouni (Biomedical Engineering Laboratory, Tlemcen University, Algeria); Mohammed Amine Chikh (Biomedical Engineering Laboratory, Tlemcen University, Algeria)

Multifractal analysis: application to medical imaging
Souad Oudjemia (University, Algeria); Nour-eddine Derguini (CDTA, Algeria)

P4: Biometrics Systems and Security

Room: Tipaza
Chair: Kurban Ubul (Xinjiang University, P.R. China)

Experimental Investigation of OC-SVM For Multibiometric Score Fusion
Nassim Abbas (University of Science and Technology Houari Boumediene & Speech Communication and Signal Processing Laboratory, Algeria); Bengherabi Messaoud (Centre de Developpement des Technologies Avancees, Algeria); Elhocine Boutellaa (Centre de Dévéloppement des Technologies Avancées (CDTA), Algeria)

A Biometric Identification Algorithm Based On Retinal Blood Vessels Segmentation Using Watershed Transformation
Hichem Betaouaf (Tlemcen University, Algeria); Abdelhafid Bessaid (Tlemcen University, Algeria)

The Fractional Fourier Transform and Its Application to Digital Watermarking
Taba Mohamed Tahar (University of Guelma, Algeria)

An efficient image encryption algorithm based on blocks permutation and Rubik's cube principle for iris images
Khaled Loukhaoukha (Laval University, Canada); Makram Nabti (Queen's University BELFAST, United Kingdom); Khalil Zebbiche (Queen's University Belfast, United Kingdom)

Subsampling-based method for testing cyclostationarity:Application to biomechanical signals
Sofiane Maiz (University of Saint Etienne Jean Monnet, France); Mohammed El Badaoui (University of Saint Etienne, France)

Improving Fingerprint Minutiae matching ing Local and Global structures
Abdallah Bengueddoudj (University of Bordj Bou Arreridj, Algeria); Samir Akrouf (University of Bordj Bou Arreridj, Algeria); Foudil Belhadj (University of msila, Algeria); Derradji Nada (University of Annaba, Algeria)

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08:30 - 08:45

Assembly

08:45 - 09:00

Introductions

09:00 - 09:45

PI 2: Sparse reconstruction using compressive sensing and its applications in signal processing

Plenary
A/Professor Tarek Al-Naffouri, King Abdullah University of Science and Technology (KAUST), KSA
Chair: Farida Cheriet (Université de Montréal, Canada)

09:45 - 10:00

Q&A: Q&A, discussion

10:00 - 11:20

SS-PRBML: Special Session on "Pattern recognition, biometrics, and machine learning"

Room: Casbah

Chair: Mohamed Cheriet (Ecole detechnologie superieure (University of Quebec), Canada)

10:00 Creation of Uyghur Offline Handwritten Database
Kurban Ubul (Xinjiang University, P.R. China); Mavjuda Zunun (Xinjiang University, P.R. China); Alim Aysa (Xinjiang University, P.R. China); Nurbiya Yadikar (Xinjiang University, P.R. China); Umut Yunus (Xinjiang University, P.R. China)

10:20 Textural Features for Arabic Writer Identification
Chawki Djeddi (University of Tebessa, Algeria); Labiba Souici-Meslati (Badji Mokhtar - Annaba University, Algeria); Imran Siddiqi (Bahria University, Algeria); Abdellatif Ennaji (Université Rouen, France)

10:40 Improving Online Signature Verification by User-Specific Likelihood Ratio Score Normalization
Elhocine Boutellaa (Centre de Dévéloppement des Technologies Avancées (CDTA), Algeria); Bengherabi Messaoud (Centre de Developpement des Technologies Avancees, Algeria); Harizi Farid (Centre de Developpement des Technologies Avancess, Algeria)

11:00 Automatic Identification of Electcal Appliances Using Smart Plugs
Antonio Ridi (University of Applied Sciences Western Switzerland Fribourg, Switzerland); Christophe Gisler (University of Applied Sciences of Western Switzerland & University of Fribourg, Switzerland); Jean Hennebert (University of Fribourg, Switzerland)

SS-RSCSP: Special Session on "Radar sonar and communication signal processing"

Room: Tipaza
Chair: Adel Belouchrani (Ecole Nationale Polythechnique, Algiers, Algeria)

10:00 A simple frequency reconfigurable microstrip patch antenna for wireless communication
Ali Mansoul (CDTA, Algeria); Hocine Kimouche (EMP, Algeria)

10:20 Adaptive Equalizer for Mode S Receiver
Allan Tart (Estonian Air Navigation Services, Estonia); Tõnu Trump (Tallinn University of Technology, Estonia)

10:40 Relay self interference minimisation using tapped filter
Saleh Al-Jazzar (KAUST, Jordan); Tareq Y. Al-Naffouri (King Abdullah University of Science and Technology, USA)

11:00 Low complexity turbo equalization over unknown frequency selective Rayleigh channels

Berdai Abdellah (Université Laval - Québec-Canada, Canada); Jean-Yves Chouinard (Laval University, Canada); Khaled Loukhaoukha (Laval University, Canada)

11:20 - 11:5

Coffee Break

11:50 - 13:00

P5: Pattern Recognition

Room: Casbah
Chair: Djamel Bouchaffra (CDTA, Algeria)

Random Forest in Semi-Supervised Learning Co-Forest
Nesma Settouti (Biomedical Engineering Laboratory, Tlemcen University, Algeria); Mostafa El Habib Daho (Biomedical Engineering Laboratory, Tlemcen University, Algeria); Amine Lazouni (Biomedical Engineering Laboratory, Tlemcen University, Algeria); Mohammed Amine Chikh (Biomedical Engineering Laboratory, Tlemcen University, Algeria)

Importance-Weighted the Imbalanced data for C-SVM Classifier to Human Activity Recognition
M'Hamed Bilal Abidine (University of Science and Technology Houari Boumedienne (USTHB), Algeria); Belkacem Fergani (USTHB, Algeria); Clavier Laurent (IEMN & Institut TELECOM, TELECOM Lille 1, France)

Appliance Consumption Signature Database and Recognition Test Protocols
Christophe Gisler (University of Applied Sciences of Western Switzerland & University of Fribourg, Switzerland); Antonio Ridi (University of Applied Sciences Western Switzerland Fribourg, Switzerland); Damien Zufferey (University of Fribourg, Switzerland); Omar Abou Khaled (University of Applied Sciences of Western Switzerland, Fribourg, Switzerland); Jean Hennebert (University of Fribourg, Switzerland)

A novel feature extractor employing a regularized MVDR spectrum estimator and a subband spectrum enhancement technique
Md. Jahangir Alam (INRS Énergie, Matériaux et Télécommunications, Canada); Douglas O'Shaughnessy (INRS-Énergie-Matériaux-Télécommunications, Canada); Patrick Kenny (CRIM, Canada)

Investigating Speaker Gender Using Rhythm Metrics in Arabic Dialects
Ali Meftah (King Saud Universty, Saudi Arabia); Sid-Ahmed Selouani (Université de Moncton Campus of Shippagan, Canada); Yousef A Alotaibi (King Saud University, Saudi Arabia)

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CRIM's French Speech Transcription System for ETAPE 2011
Vishwa Gupta (CRIM, Canada); Gilles Boulianne (Centre de Recherche Informatique de Montreal (CRIM), Canada); Frédéric Osterrath (Centre de Recherche Informatique de Montreal (CRIM), Canada); Pierre Ouellet (Centre de Recherche Informatique de Montreal (CRIM), Canada)

Analysis of speech production in a noisy environment
El Mouatassim Benzitouni (USTHB FEI Alger, Algeria); Leila Falek (Bab Ezzouar Alger, Algeria); Teffahi Hocine (USTHB FEI Alger, Algeria); Djeradi Amar Amar (USTHB electronique Bab Ezzouar Alger, Algeria)

Use of artificial ants in a biometric checking system by Iris recognition
Adlania Senouci (University of Science and Technologie ORAN MB & Signal Image and Speech Laboratory, Algeria); Abdelkader Benyettou (University USTO - Oran, Algeria)

An Efficient FPGA Implementation of Gaussian Mixture Models Based Classifier: Application to Face Recognition
Mehdi Neggazi (CDTA, Algeria); Bengherabi Messaoud (Centre de Developpement des Technologies Avancees, Algeria); Boulkenafet Zinelabidine (CDTA, Algeria); Abbes Amira (University of the West of Scotland, United Kingdom)

P6: Signal Detection and Estimation

Room: Tipaza
Chair: Mourad Adnane (Ecole Nationale Polytechnique d'Alger, Algeria)

Sensor fault detection and diagnosis in drinking water distribution networks
Soumia Bouzid (University of Badji Mokhtar Annaba, Algeria)

Priori-sensitive Resampling Particle Filter for Dynamic State Estimation of UUV
Subhra Kanti Das (CSIR-CMERI, India); Chandan Mazumdar (Jadavpur University, India)

Design of a multiblock general regression neural network for wind speed prediction in algeria
Fouzi Douak (University of Batna, Algeria); Nabil Benoudjit (University of Batna, Algeria); Farid Melgani (University of Trento, Italy)

Recognition Of Aggressive Human Behavior Based On Surf And SVM
Abdelhak Ouanane (USTHB, Algeria); Amina Serir (USTHB, Algeria); Nacereddine Djelal (University of Science and Technology Houari Boumediene USTHB, Algeria)

Fault Detection and Diagnosis in Rotating Machinery by Vibration Monitoring Using FFT and Wavelet Techniques

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Issam Atoui (Industrial Technologies Research Unit URTI-CSC, Algeria); Hazem Meradi (Industrial Technologies Research Unit URTI-CSC, Algeria); Ramzi Boulkroune (Iron and Steel Applied Research Unit-CSC, Algeria); Riad Saidi (Industrial Technologies Research Unit URTI-CSC, Algeria); Azzeddine Grid (Industrial Technologies Research Unit URTI-CSC, Algeria)

An enhanced technique for roller bearing defect detection using an impulse response wavelet based sparse code shrinkage de-noising algorithm
Mohammed Boufenar (Ecole Nationale Polytechnique, Algeria); Said Rechak (Ecole Nationale Polytechnique, Algeria)

Revisiting the ROC curve for diagnostic applications with an unbalanced class distribution
Christian O'Reilly (Hôpital du Sacré-Coeur de Montréal, Canada); Tore Nielsen (Hôpital du Sacré-Coeur de Montréal, Canada)

3D Radar using augmented 2D hardware - sampling and processing concepts
Graeme S Jones (Accipiter Radar Technologies Inc, Canada); Peter Weber (Accipiter Radar Technologies Inc, Canada); Tim J Nohara (Accipiter Radar Technologies Inc, Canada)

SAR Images Noise-Removal Method Using The Stationary Contourlet Transform
Ourabia Soumya (USTHB, Algeria); Souhila Boutarfa (USTHB, Algeria)

A Comparison of Quadratic TFDs for Entropy Based Detection of Components Time Supports in Multicomponent Nonstationary Signal Mixtures
Nicoletta Saulig (University of Rijeka, Croatia); Victor Sucic (University of Rijeka, Croatia); Boualem Boashash (University of Queensland, Australia); Damir Seršić (University of Zagreb Faculty of Electrical Engineering and Computing, Croatia)

13:00 - 14:00

Lunch

14:00 - 18:00

SE: Social Event

Wednesday, May 15

08:30 - 08:45

Asbly: Assembly

08:45 - 09:00

Intro: Introductions

09:00 - 09:45

PI 3: DSP Research enhancement, Ethics & Medical research issues

Plenary
Professor Boualem Boashash (Qatar University & University of Queensland, Australia)
Chair: Tareq Y. Al-Naffouri (King Abdullah University of Science and Technology, USA)

09:45 - 10:00

Q&A: Q&A, discussion

10:00 - 11:20

SS-CRWC: Special Session on "Cognitive radio for wireless communications"

Room: Casbah
Chair: Jean-Yves Chouinard (Laval University, Canada)

10:00 Flexible OFDM System for Peak Power reduction in OFDM-Based Cognitive Radio Context
Badreddin Koussa (University & Sic-Xlim Laboratory, France); Smail Bachir (University de Poitiers, France); Clency Perrine (Université de Poitiers, France); Claude Duvanaud (XLIM-SIC, Université de Poitiers, IUT, Angoulême, France); Rodolphe Vauzelle (IRCOM SIC University of Poitiers, France)

10:20 Flexicells and sdr4all- a cognitive radio test bed
Sylvain Azarian (Supélec, France); Mérouane Debbah (Supelec, France)

10:40 Exploiting the pilot pattern orthogonality of ofdma signals for the estimation of base stations number of antennas
Mohamed Rabie Oularbi (TELECOM Bretagne, France); Saeed Gazor (Queen's University, Canada); Abdeldjalil Aïssa-El-Bey (TELECOM Bretagne, France); Sebastien Houcke (Institut TELECOM ; TELECOM Bretagne, France)

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11:00 Order-Statistics Minimum Error Detector for Optimal Delay Detection in Multipath Rayleigh Fading Channel Context
Boudjellal Abdelouahab (Polytech'Orléans, France); Karim Abed-Meraim (Dept TSI, Télécom Paris & University of Sharjah, UAE, France); Adel Belouchrani (Ecole Nationale Polythechnique, Algiers, Algeria)

11:50 - 13:00

P7: Wireless Communications & signal processing

Room: Casbah
Chair: Abdeldjalil Aïssa-El-Bey (TELECOM Bretagne, France)

Interferometer Phase Error and Chromatic Dispersion effects on the Performances of 40 Gbit/s Optical DPSK Transmission Systems
Lazhar Kassa Baghdouche (Université 8 mai 1945 Guelma, Algeria); Simohamed Lotfy Mokhtar (SEO Laboratory, EMP, Algeria)

Adaptation of Bit Recycling to Arithmetic Coding
Ahmad Al-rababa'a (Université Laval, Canada); Danny Dubé (Université Laval, Canada)

New Clustering Scheme for Wireless Sensor Networks
Mohamed-Lamine Messai (University of A. Mira Bejaia, Algeria)

Incremental Induction Rules Clustering
Amine Mohamed Chemchem (USTHB-LRIA, Algeria); Youcef Djenouri (USTHB University, Algeria); Habiba Drias (USTHB University of Algiers & LRIA, Algeria)

Effect of Multi-users and Multipaths on the Performance of an Adaptive Serial Acquisition Scheme for DS/CDMA Systems
BENKRINAH Sabra (Kasdi Merbah Ouargla University, Algeria); Malek Benslama (Constantine University, Algeria)

P8: Satellite Communications & signal processing

Room: Tipaza
Chair: Tareq Y. Al-Naffouri (King Abdullah University of Science and Technology, USA)

GPU based ambiguity function computing algorithm
Dmitry Marychev (Nizhny Novgorod State University (NNSU), Russia); Alexey Loginov (Nizhny Novgorod State University (NNSU), Russia)

MIL-STD-188-110B Standard HF Modem Design using Agilent ADS

Mustapha Chouiha (Military Polytechnic School, Algeria); Mustapha Djeddou (Military Polytechnic School, Algeria)

Common GPS/GALILEO Signals: MBOC vs BOC(1,1) Performance Comparison
Sihem Zitouni (University of Bejaia, Algeria); Chikouche Djamel (University of M'sila & LIS Laboratory, University of setif, Algeria); Khaled Rouabah (LMSE Laboratory, Mohamed Bachir El Ibrahimi University, Bordj Bou Arreridj, Algeria)

New procedure in designing 2D-IIR filters based on 2D-FIR filters approximation
Lahcène Mitiche (University of Djelfa, Algeria); Amel Baha Houda Adamou-Mitiche (University of Djelfa, Algeria)

Design and Performance Evaluation of 802.11ad PHYs in 60 GHz Multipath Fading Channel
Mohammed Zakarya Zaaimia (University of Science and Technology Houari Boumediene, Algeria); Rachida Touhami (Université des Sciences et de La Technologie HOUARI BOUMEDIENE, Algeria); Abdelkrim Hamza (Electronics and Computer Science Faculty, USTHB, Algeria); Mustapha Yagoub (University of Ottawa, Canada)

Acquisition of the Galileo AltBoc signal with a fixed and adaptive threshold
Siham Dehouche (University of Blida, Algeria)

13:00 - 14:00

Lunch

14:00 - 15:00

CC: Closing Ceremony

Chair: Boualem Boashash (Qatar University, Doha & University of Queensland, Brisbane, Australia);
Co-Chair: Brahim Bouzouia, CDTA,
Speaker: Ubul Kurban, China

Master Ceremony: Mohamed Cheriet (Ecole de Technologie Supérieure, Montreal, Canada)

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