

# 27<sup>th</sup> EUSIPCO 2019

European Signal  
Processing Conference

A Coruña, Spain, September 2-6, 2019



## Final Program

# Organized by :

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**Owner**  
**EURASIP**



**UNIVERSIDADE  
DA CORUÑA**

**Organizer**  
**UDC**



**Technical  
Co-Sponsor**  
**IEEE SPS**

**#EUSIPCO2019**  
**[www.eusipco.org](http://www.eusipco.org)**

# WELCOME

"Balcony of the Atlantic", "City of Crystal", "Herculine City" are some of the names of A Coruña, the city where nobody is a stranger, venue of the 27th European Signal Processing Conference, **EUSIPCO 2019**.

On behalf of the Organizing Committee and the **EURASIP** leadership, it is our great pleasure to welcome you to EUSIPCO 2019 which will be held at the A Coruña Conference Center, PALEXCO, from September 2nd to 6th, 2019.

EUSIPCO 2019 offers an attractive technical program with more than 500 papers being presented in 78 lecture and poster sessions, of which 10 are special sessions. The program includes four plenary talks given by internationally renowned speakers, 10 tutorials presented by prominent experts, and two Satellite Workshops.

In order to encourage student participation, the future of our scientific community, the program includes the final rounds of two student-oriented competitions, the Student Paper Competition and the Three-Minute Thesis Contest.

We would like to thank all the authors who have submitted articles for presentation at **EUSIPCO 2019**. There were 820 submissions which required a huge amount of revision work distributed between Area Chairs and reviewers, wisely led by our Technical Program co-chairs, Sabrina Greco and Marius Pesavento. To all of them, thank you for your extraordinary effort.

In addition to the technical activities, EUSIPCO 2019 offers an exciting program of social events with a welcome reception at PALEXCO; a visit to the Aquarium Finisterrae, a scientific museum dedicated to marine science; and a banquet at the Pazo de Vilaboa, a noble and beautiful nineteenth century building perfect to taste the traditional Galician cuisine.

The organization of EUSIPCO 2019 has been possible because of the work of countless people. We would like to thank all the members of the Organizing Committee for their work and assistance. Also, to the **EURASIP BoD** for believing in us for the organization of the conference. We thank the plenary speakers, the tutorial presenters, the special session organizers, the session chairs, and the satellite workshop organizers for their important contributions. At the local level, we thank the University of A Coruña Foundation and our Professional Conference Organizer, Océano Azul.

Finally, we are extremely grateful to all our sponsors, patrons, supporters, and exhibitors.

We hope that EUSIPCO 2019 will turn into an unforgettable experience, which will remain in the memory of the participants for its outstanding scientific quality, as well as for the charm of **A Coruña**, the beauty of its surroundings, the splendor of its history, the exquisiteness of its gastronomy, and the hospitality of its people.



**Mónica F. Bugallo**



**Luis Castedo**

## **EUSIPCO 2019 General Co-Chairs**

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# Committee

Mónica F. Bugallo. *Stony Brook University, USA*  
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**GENERAL CO-CHAIR**

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Marius Pesavento. *University of Darmstadt, Germany*  
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**SAT WORKSHOPS CHAIR**

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**STUDENTS ACTIVITIES CO-CHAIR**

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**STUDENTS ACTIVITIES CO-CHAIR**

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**PUBLICITY CHAIR**

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**INTERNATIONAL LIAISON**

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**LOCAL CHAIR**

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**DIRECTOR FOR TECHNICAL PROGRAMS AND MEMBERSHIP**

Augusto Sarti

**DIRECTOR FOR CONFERENCES**

Alle-Jan van der Veen

**DIRECTOR FOR PUBLICATIONS**

# ABOUT #EUSIPCO2019

## Conference Dates

2<sup>nd</sup> – 6<sup>th</sup>  
SEPTEMBER, 2019

## Website and Email

Website: [www.eusipco2019.com](http://www.eusipco2019.com)  
Email: [eusipco2019@oceano-azul.es](mailto:eusipco2019@oceano-azul.es)  
Twitter: [@EUSIPCO2019](https://twitter.com/EUSIPCO2019)  
HT: [#eusipco2019](https://twitter.com/EUSIPCO2019)  
We encourage you to tweet during the conference to share your experience/photos with colleagues around the world.  
Technical Secretariat:  
**Océano Azul Comunicación**

## Language

The official language of Eusipco is **English**.





# ABOUT THE VENUE

## Venue

A Coruña Conference Center (**PALEXCO**) has become an international reference for hundreds of companies, associations and agencies that have chosen to hold their events there.

Elegance and functionality are the keys to this project designed by César Portela and Ricardo Bofill, but even more impressive is the unique design of its roof, which resembles the wings of a giant seabird, in perfect harmony with the port setting and the city's intimate historical connection to the sea.

Palexco is strategically located facing the sea and right in the heart of A Coruña's historic center. Surrounded by the best hotels and restaurants and the most select shops.

## Wi-Fi Area

The building is WI-FI enabled allowing connection to the internet.

**User: eusipco**

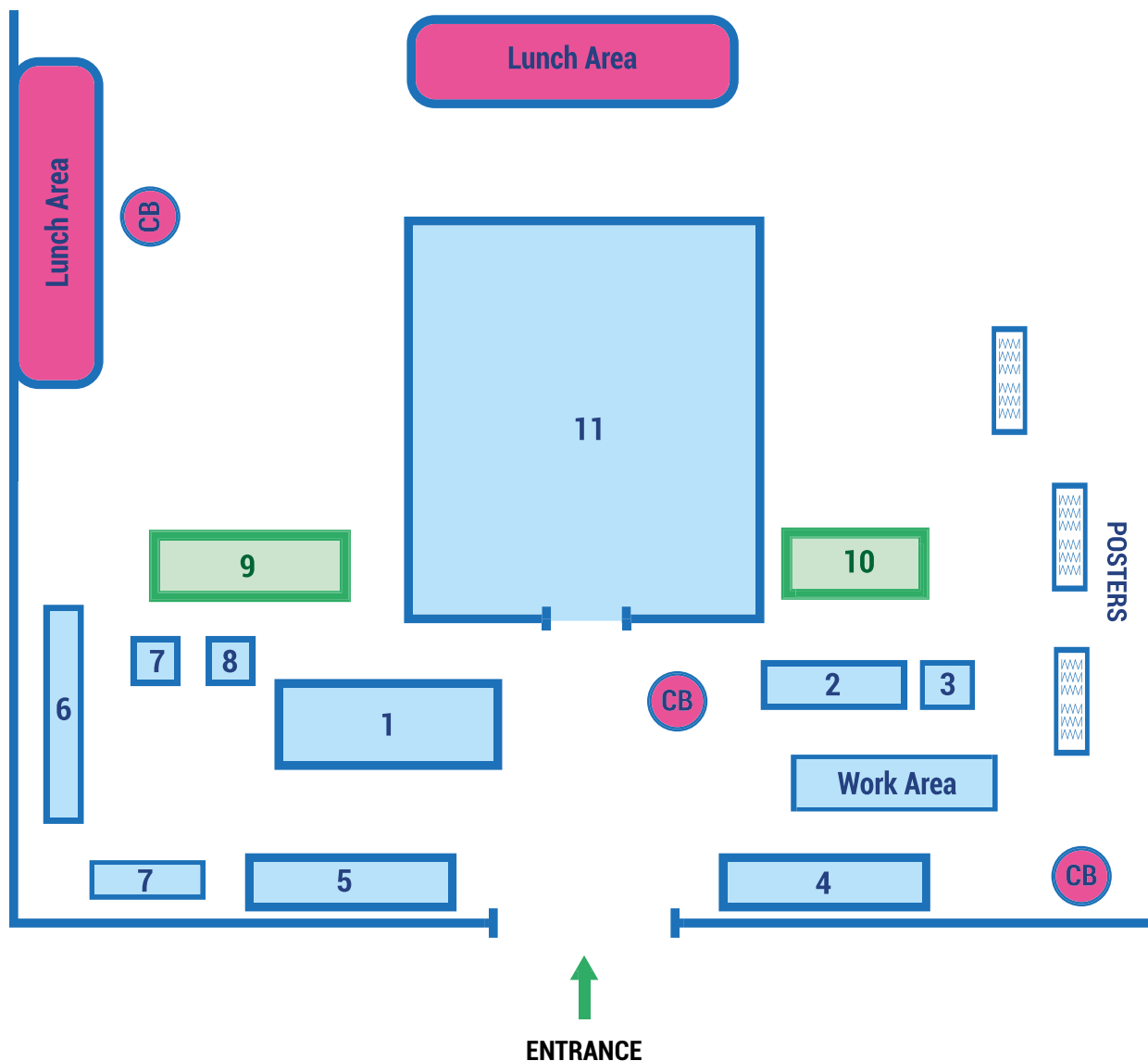
**Password: eusipco19**

## Cloakroom

Available on the ground floor, main hall (Check-in area) only for suitcases. It will be free of charge.

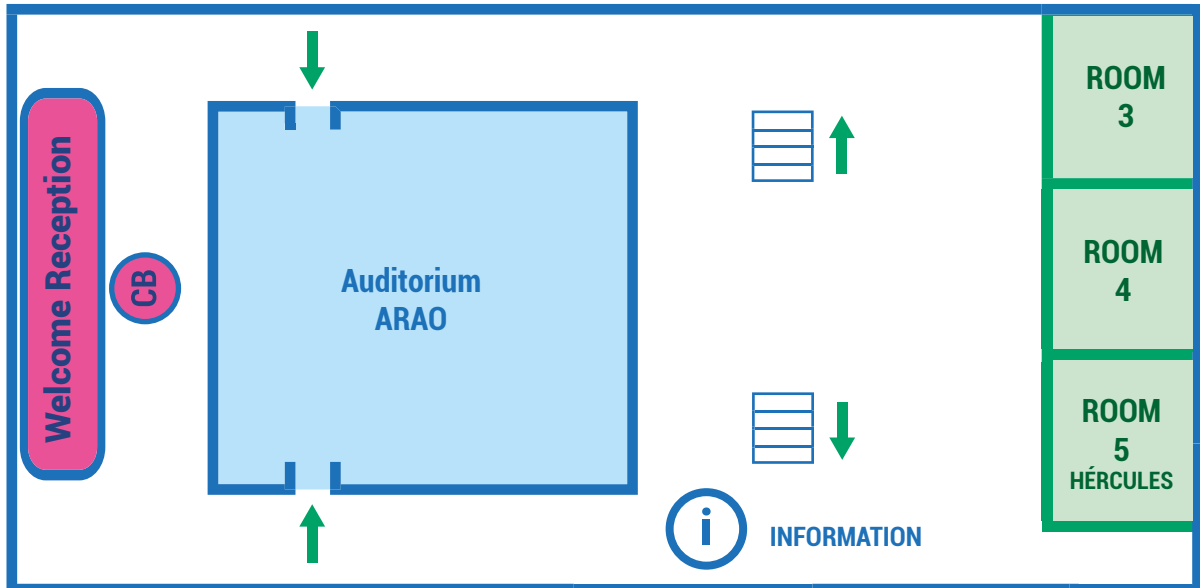


# GROUND FLOOR

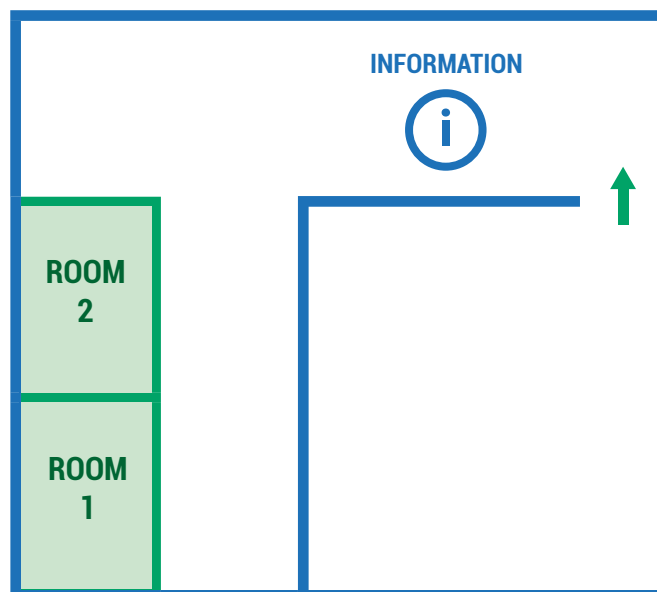


- 1 - Check-in Area
- 2 - Technical Secretariat
- 3 - A Coruña Information Desk
- 4 - Poster Reception Area
- 5 - Speakers and Presenters point
- 6 - Snack bar
- 7 - Exhibitors
- 8 - Cloak Room
- 9 - **Bitácora Room**
- 10 - **Azimut Room**
- 11 - Auditorium Gaviota
- CB - Coffee Break

# 2nd FLOOR



# 3rd FLOOR



# ABOUT CHAIRS AND PRESENTERS

## Chairpersons

Chairpersons should locate their room as soon as possible and arrive no later than 15 minutes prior to the beginning of their session. A person from organization will provide you a session sheet to fill in and return it to the organization after the session. It is the responsibility of the chairperson to maintain a strict time schedule.

## Presenters

The presenters should arrive no later than 15 minutes before the scheduled start time and check-in with the Session Chair. The presenters should deliver their presentation slides at least 1 hour before the scheduled start time in the Speakers and Presenters point.

## Certificates

The attendance certificate will be sent by email to all attendants

## Posters Tips

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- Posters should be attached to the presentation boards no later than 15 minutes before the scheduled session.
- Means to attach posters to presentation boards will be provided.
- Posters should remain in place for the full session duration and then removed no later than 5 minutes after the scheduled end time.
- Posters left mounted to the boards after end of the session will be removed and disposed
- Presenters must check-in with the Session Chairs prior to the session start and remain with their posters throughout the presentation

# ABOUT ATTENDEES

## Badges and Bags

Badges and Bags may be collected from 8:30 a.m. on Monday September 2nd in the check-in area and will be opened during all regular hours of the conference.

**IMPORTANT:**

Registered delegates are required to carry their badge at all times in order to gain access to the Conference

## Program Changes

The organizers cannot assume liability for any changes in the programme due to external and/or unforeseen circumstances.

## Phones

Mobile Phones must be switched off in the conference rooms and in the poster exhibition area.

## Coffee and Lunch Area

Coffee and tea will be provided during the official break times. Please advise us in advance of any special dietary requirements. Lunch will be in the same Area.



# ABOUT THE CITY

## Language

The official language in Spain is Spanish. The official language of the conference is English.

## Time Zone

GMT + 1 hour  
(in summer GMT + 2)

## Climate

The average temperatura in A Coruña in September ranges between 15 C° – 22 C°.

## Currency

In Spain the official currency is Euro. Coins: 1, 2, 5, 10, 20, and 50 cents, 1€ and 2€. One Euro consists of 100 cents.  
Notes: 5€, 10€, 20€, 50€, 100€, 200€ and 500€.

## Banks and Debit Credit Cards

Opening hours: From 8.30 to 14.30  
From Monday to Friday.  
Visa, Mastercard or American Express are accepted in most shops, restaurants and some taxis.



# SOCIAL PROGRAM

## Welcome Reception

Date: **Monday September 2nd**

Venue: **Palexco**

Time: **20:00 - 22:30**

Welcome cocktail will be held at Palexco. All delegates are invited to attend and enjoy with typical Spanish tapas and wines.

## Aquarium

Date: **Tuesday September 3rd**

Venue: **Aquarium Finisterrae**

Time: **20:00**

Price: **30€**

To be able to enjoy a private visit and cocktail dinner in the facilities of an aquarium, a unique place, becomes a magical and unforgettable experience. This place is located on the promenade, so outside also impresses with its views.



# Conference Banquet

Date: **Wednesday September 4th**  
Venue: **Pazo de Vilaboa**

Time: **20:00**

Price:

- **Full registration: 30 €**
- **Student registration: 10 €**
- **Additional tickets for guests: 80 €**

The Pazo de Vilaboa is the perfect place to taste the traditional Galician cuisine, but also to appreciate the majestic architecture that composes it.

It is a noble and beautiful nineteenth century building that leaves no one indifferent, and is located only ten minutes from the center of A Coruña in the parish of Rutis in Vilaboa.

It is located in an incomparable natural enclave, surrounded by large gardens that make it a perfect place to celebrate outdoors.



Buses will departure at **19:30** from the following hotels:

- **NH Collection Finisterre**
- **Eurostar Atlántico**
- **Meliá María Pita**
- **Riazor**
- **Hesperia A Coruña**

## Things to do in A Coruña

We have organized different tours and activities to do during the conference days, for more info, please go to A Coruña Information Desk or check our website.

[www.eusipco2019.org](http://www.eusipco2019.org)





**SCIENTIFIC PROGRAM**

# PROGRAM OVERVIEW

- Tutorials
- Plenary Speakers
- Papers
- Satellite Workshop
- Breaks
- Social Events

	MONDAY, SEPTEMBER 2	TUESDAY, SEPTEMBER 3		
8:30 - 9:00	Check-in	Opening and Awards Ceremony Auditorio Gaviota		
9:00 - 9:30	T01 .A: Room 1	PLEN - 1: Auditorio Gaviota		
9:30 - 10:00	T02 .A: Room 2			
10:00 - 10:30	T03 .A: Room 3			
10:30 - 11:00	T04 .A: Room 4			
10:30 - 11:00	T05 .A: Room 5	Coffee Break		
11:00 - 11:30	Coffee Break	Coffee Break		
11:00 - 11:30	T01 .B: Room 1	SS3: Room 1 ASMSP LI: Room 2 BISA LI: Room 3 SPCN LI: Room 4 TMTSP LI: Auditorio Gaviota BISA PI: Poster Area 1 VIP PII: Poster Area 2 SiG - DML PI: Poster Area 3		
11:30 - 12:00	T02 .B: Room 2			
12:00 - 12:10	T03 .B: Room 3			
12:10 - 12:30	T04 .B: Room 4			
12:30 - 12:40	T05 .B: Room 5			
12:40 - 13:0	Break		Lunch Break	
13:00 - 13:10		SS4: Room 1 SS2: Room 2 BISA LII: Room 3 SiG - DML LI: Room 4 VIP LI: Auditorio Gaviota TMTSP PI: Poster Area 1 TMTSP PII: Poster Area 2 SPMuS PI: Poster Area 3		
13:10 - 13:30			Lunch Break	
13:30 - 13:40				Coffee Break
13:40 - 14:00				
14:00 - 14:30	T06 .A: Room 1	SS10: Room 1 ASMSP LII: Room 2 DIS LI: Room 3 VIP LII: Room 4 TMTSP LII: Auditorio Gaviota OSPA PI: Poster Area 1 BISA PI: Poster Area 2 BISA PII: Poster Area 3		
14:30 - 15:00	T07 .A: Room 5			
15:00 - 15:10	T08 .A: Room 3			
15:10 - 15:30	T09 .A: Room 4			
15:30 - 15:40	T10 .A: Room 2			
15:40 - 16:00	Coffee Break		Coffee Break	
16:00 - 16:10	Coffee Break	Coffee Break		
16:10 - 16:30	T06 .B: Room 1	3MT Contest: Auditorio Gaviota		
16:30 - 17:00	T07 .B: Room 5			
17:00 - 17:20	T08 .B: Room 3			
17:20 - 17:30	T09 .B: Room 4			
17:30 - 17:45	T10 .B: Room 5			
17:45 - 17:50	Student Paper Competition: Poster Area 1 Poster Area 2 Poster Area 3	Aquarium		
17:50 - 18:00			Welcome reception	
18:00 - 18:30				
18:30 - 19:00				
19:00 - 19:30				
19:30 - 20:00				
20:00 - 20:30				
20:30 - 22:00				
22:00 - 22:30				
22:30 - 23:30				

WEDNESDAY, SEPTEMBER 4	THURSDAY, SEPTEMBER 5	FRIDAY, SEPTEMBER 6		
Check-in	Check-in	Check-in	8:30 - 9:00	
PLEN - 2: Auditorio Arao	PLEN - 3: Auditorio Arao	PLEN - 4: Auditorio Arao	9:00 - 9:30	
			9:30 - 10:00	
Coffee Break		Coffee Break	10:00 - 10:30	
SPCN LII: Room 1 ASMSP LIII: Room 2 BISA LIII: Room 3 SiG - DML LII: Room 4 TMTSP LIII: Auditorio Arao VIP PIIL: Poster Area 1 SPMuS PII: Poster Area 2 SPMuS PIIL: Poster Area 3	Coffee Break	ASMSP LVI: Room 1 SPMuS LVI: Room 2 VIP LVI: Room 3 TMTSP LVII: Auditorio Arao TMTSP PV: Poster Area 1 SS7: Poster Area 2	10:30 - 11:00	
	SS9: Room 1 SPMuS LIII: Room 2 BISA LIV: Room 3 SiG - DML LIV: Room 4 VIP LIV: Auditorio Arao TMTSP PIIL: Poster Area 1 TMTSP PIV: Poster Area 2 SPCN PI: Poster Area 3		SW1L: Room 4	11:00 - 11:30
				11:30 - 12:00
				12:00 - 12:10
Lunch Break	Lunch Break		12:10 - 12:30	
			12:30 - 12:40	
SS5: Room 1 SPMuS LI: Room 2 BForSec: Room 3 SiG - DML LIII: Room 4 VIP LIII: Auditorio Arao ASMSP PI: Poster Area 1 ASMSP PII: Poster Area 2 SS6: Poster Area 3	SS8: Room 1 SPMuS LIV: Room 2 BISA LV: Room 3 SiG - DML LV: Room 4 TMTSP LV: Auditorio Arao ASMSP PIIL: Poster Area 1 VIP PIV: Poster Area 2 SPCN PII: Poster Area 3	SW2: Room 4	12:40 - 13:0	
			13:00 - 13:10	
			13:10 - 13:30	
			13:30 - 13:40	
Coffee Break	Coffee Break	SW1P: Poster Area 1	13:40 - 14:00	
			14:00 - 14:30	
SS9: Room 1 ASMSP LIV: Room 2 SPMuS LII: Room 3 SPCN LIII: Room 4 TMTSP LIV: Auditorio Arao SiG - DML PII: Poster Area 1 DIS PI - DSP: Poster Area 2 SS1: Poster Area 3	VIP LV: Room 1 ASMSP LV: Room 2 SPMuS LV: Room 3 SPCN LIV: Room 4 TMTSP LVI: Auditorio Arao SiG - DML PIIL: Poster Area 1 BISA PIV: Poster Area 2 BISA PIIL: Poster Area 3		14:30 - 15:00	
			15:00 - 15:10	
			15:10 - 15:30	
			15:30 - 15:40	
			15:40 - 16:00	
			16:00 - 16:10	
			16:10 - 16:30	
			16:30 - 17:00	
			17:00 - 17:20	
			17:20 - 17:30	
			17:30 - 17:45	
			17:45 - 17:50	
			17:50 - 18:00	
			18:00 - 18:30	
			18:30-19:00	
			19:00 - 19:30	
Conference Banquet			19:30 - 20:00	
			20:00 - 20:30	
			20:30 - 22:30	
			22:30 - 23:30	

# PLENARY SPEAKERS



## Josiane Zerubia

Josiane Zerubia has been a permanent research scientist at INRIA since 1989 and director of research since July 1995.

She was successively head of 3 laboratories in remote sensing from 1995 to 2016. She has been adjunct-professor at ISAE-SUPAERO in Toulouse since 1999. Her main research interest is in signal and image processing using probabilistic models. She also works on parameter estimation, statistical learning and optimization techniques.

In terms of applications, she worked on speech processing (1982-1988), biological image processing (2001-2011), skin imaging (2009-2018) and remote sensing (1988-). She published a book on Markov random fields in image segmentation in 2012 (Now pub.), co-authored with Prof. Zoltan Kato. She was co-editor with Prof. Gabriele Moser of a book on mathematical models for remote sensing image processing in 2018 (Springer pub.).

She has been nominated EURASIP Fellow in 2019. She is also a Fellow of the IEEE (2003) and was IEEE SP Society Distinguished Lecturer (2016-2017).

She received the excellency award from Université Cote d'Azur (UCA) in 2016, several best paper awards with her students and collaborators, and was made "Chevalier de l'Ordre National du Mérite" by the President of the French Republic in 2002 for an exemplary career in research.



## Yurii Nesterov

Yurii Nesterov is a professor at the Center for Operations Research and Econometrics (CORE) in the Catholic University of Louvain (UCL), Belgium. He received Ph.D. degree (Applied Mathematics) in 1984 at Institute of Control Sciences, Moscow. Starting from 1993 he works at Center of Operations Research and Econometrics (Catholic University of Louvain, Belgium).

His research interests are related to complexity issues and efficient methods for solving various optimization problems.

The main results are obtained in Convex Optimization (optimal methods for smooth problems, polynomial-time interior-point methods, smoothing technique for structural optimization, complexity theory for second-order methods, optimization methods for huge-scale problems). He is an author of 5 monographs and more than 100 refereed papers in the leading optimization journals.

He got several international prizes, among which there are Dantzig Prize from SIAM and Mathematical Programming society (2000), von Neumann Theory Prize from INFORMS (2009), SIAM Outstanding paper award (2014), and Euro Gold Medal from Association of European Operations Research Societies (2016). In 2018 he won an Advanced Grant from the European Research Council.

# PLENARY SPEAKERS



## Raymond Knopp

Raymond Knopp is professor in the Communication Systems Department at EURECOM. He is also currently a part-time visiting professor at the Beijing University of Posts and Telecommunications under the Discipline Innovative Engineering Plan.

His current research and teaching interests are in the area of digital communications, software radio architectures, and implementation aspects of signal processing systems and real-time wireless networking protocols. He has a proven track record in managing both fundamental and experimental research projects at an international level and is also General Secretary of

the OpenAirInterface.org open-source academia-industry radio platform initiative which aims to bridge the gap between cutting-edge theoretical advances in wireless communications and practical designs.



## Alejandro Ribeiro

Department of Electrical and Systems Engineering, University of Pennsylvania, Philadelphia, USA

Alejandro Ribeiro received the B.Sc. degree in electrical engineering from the Universidad de la Republica Oriental del Uruguay, Montevideo, in 1998 and the M.Sc. and Ph.D. degree in electrical engineering from the Department of Electrical and Computer Engineering, the University of Minnesota, Minneapolis in 2005 and 2007. From 1998 to 2003, he was a member of the technical staff at Bellsouth Montevideo. After his M.Sc. and Ph.D studies, in 2008 he joined the University of Pennsylvania (Penn), Philadelphia, where he is currently Professor of Electrical and Systems Engineering.

His research interests are in the applications of statistical signal processing to collaborative intelligent systems. His specific interests are in wireless autonomous networks, machine learning on network data and distributed collaborative learning. Papers coauthored by Dr. Ribeiro received the 2014 O. Hugo Schuck best paper award, and paper awards at CDC 2017, SSP Workshop 2016, SAM Workshop 2016, Asilomar SSC Conference 2015, ACC 2013, ICASSP 2006, and ICASSP 2005. His teaching has been recognized with the 2017 Lindback award for distinguished teaching and the 2012 S. Reid Warren, Jr. Award presented by Penn's undergraduate student body for outstanding teaching. Dr. Ribeiro is a Fulbright scholar class of 2003 and a PennFellow class of 2015.

Monday

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## MONDAY, SEPTEMBER 2<sup>ND</sup>

**8:30 - 9:00**      **CHECK-IN**

**9:00 - 10:30**      **TUTORIALS**

ROOM 1

**T01.A:** **Deep learning for music separation**  
Antoine Liutkus (Inria, LIRMM, University of Montpellier, France),  
Fabian-Robert Stöter (Inria, LIRMM, University of Montpellier, France)

ROOM 2

**T02.A:** **Portfolio Optimization in Financial Markets**  
Daniel P. Palomar (Hong Kong University of Science and Technology)

ROOM 3

**T03.A:** **Communication Networks Design: Model-Based, Data-Driven, or Both?**  
Alessio Zappone (University of Cassino and Southern Lazio, Italy), Marco Di Renzo (Paris-Saclay University, France), Merouane Debbah (Paris-Saclay University, France)

ROOM 4

**T04.A:** **Connecting the Dots: Identifying Network Structure of Complex Data via Graph Signal Processing**  
Gonzalo Mateo (University of Rochester, USA), Santiago Segarra (Rice University, USA)

ROOM 5

**T05.A:** **Point cloud coding: The status quo**  
Joao Ascenso (Instituto Superior Técnico, Portugal), Fernando Pereira (Instituto Superior Técnico, Portugal)

**10:30 - 11:00**      **Coffee break**

**11:00 - 12:30**      **TUTORIALS**

ROOM 1

**T01.B:** **Deep learning for music separation**  
Antoine Liutkus (Inria, LIRMM, University of Montpellier, France), Fabian-Robert Stöter (Inria, LIRMM, University of Montpellier, France)

ROOM 2

**T02.B:** **Portfolio Optimization in Financial Markets**  
Daniel P. Palomar (Hong Kong University of Science and Technology)

ROOM 3

**T03.B:** **Communication Networks Design: Model-Based, Data-Driven, or Both?**  
Alessio Zappone (University of Cassino and Southern Lazio, Italy), Marco Di Renzo (Paris-Saclay University, France), Merouane Debbah (Paris-Saclay University, France)

## ROOM 4

**T04.B:** **Connecting the Dots: Identifying Network Structure of Complex Data via Graph Signal Processing**  
Gonzalo Mateo (University of Rochester, USA), Santiago Segarra (Rice University, USA)

## ROOM 5

**T05.B:** **Point cloud coding: The status quo**  
Joao Ascenso (Instituto Superior Técnico, Portugal), Fernando Pereira (Instituto Superior Técnico, Portugal)

**12:30 - 14:00** **Lunch break**

**14:00 - 15:30** **TUTORIALS**

## ROOM 1

**T06.A:** **Determinantal Point Processes in Signal Processing and Machine Learning**  
Simon Barthelme (CNRS, University of Grenoble, France), Nicolas Tremblay (CNRS, University of Grenoble, France)

## ROOM 5

**T07.A:** **Misspecified and Semiparametric lower bounds and their application to inference problems with Complex Elliptically Symmetric distributed data**  
Stefano Fortunati (University of Pisa, Italy), Fulvio Gini (University of Pisa, Italy)

## ROOM 3

**T08.A:** **Multi-Microphone Source Localization on Manifolds**  
Sharon Gannot (Bar-Ilan University, Israel), Bracha Laufer-Goldshtein (Bar-Ilan University, Israel), Ronen Talmon (Technion, Israel)

## ROOM 4

**T09.A:** **Proximal Gradient Algorithms Applications in Signal Processing**  
Niccolò Antonello (Idiap Research Institute, Switzerland), Panagiotis Patrinos (KU Leuven, Belgium), Toon van Waterschoot (KU Leuven, Belgium), Lorenzo Stella (Amazon Development Center, Berlin, Germany)

## ROOM 2

**T10.A:** **Random Matrix Advances in Large Dimensional Statistics, Machine Learning and Neural Nets**  
Romain Couillet (Paris-Saclay University, France), Mohamed Seddik (Paris-Saclay University, France), Malik Tiomoko (Paris-Saclay University, France)

**15:30 - 16:00** **Coffee break**

# Monday

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## 16:00 - 17:30 TUTORIALS

### ROOM 1

**T06.B:** **Determinantal Point Processes in Signal Processing and Machine Learning**  
Simon Barthelme (CNRS, University of Grenoble, France), Nicolas Tremblay (CNRS, University of Grenoble, France)

### ROOM 5

**T07.B:** **Misspecified and Semiparametric lower bounds and their application to inference problems with Complex Elliptically Symmetric distributed data**  
Stefano Fortunati (University of Pisa, Italy), Fulvio Gini (University of Pisa, Italy)

### ROOM 3

**T08.B:** **Multi-Microphone Source Localization on Manifolds**  
Sharon Gannot (Bar-Ilan University, Israel), Bracha Laufer-Goldshtein (Bar-Ilan University, Israel), Ronen Talmon (Technion, Israel)

### ROOM 4

**T09.B:** **Proximal Gradient Algorithms Applications in Signal Processing**  
Niccolò Antonello (Idiap Research Institute, Switzerland), Panagiotis Patrinos (KU Leuven, Belgium), Toon van Waterschoot (KU Leuven, Belgium), Lorenzo Stella (Amazon Development Center, Berlin, Germany)

### ROOM 2

**T10.B:** **Random Matrix Advances in Large Dimensional Statistics, Machine Learning and Neural Nets**  
Romain Couillet (Paris-Saclay University, France), Mohamed Seddik (Paris-Saclay University, France), Malik Tiomoko (Paris-Saclay University, France)

## 17:45 - 19:30

### POSTER AREA

### STUDENT PAPER COMPETITION

#### A1.1

**On the Relation Between DOA-Vector Eigenbeam ESPRIT and Subspace Pseudointensity-Vector**  
Adrian Herzog and Emanuël Habets (International Audio Laboratories Erlangen, Germany)

#### A1.2

**Fast Alignment of Limited Angle Tomograms by Projected Cross Correlation**  
Ricardo M. Sánchez (Max Planck Institute for Biophysics & Goethe University, Germany); Rudolf Mester (Goethe University, Frankfurt & VSI Lab, Germany); Mikhail Kudryashev (Max Planck Institute for Biophysics, Germany)

#### A1.3

**Comparing Optimization Methods of Neural Networks for Real-time Inference**  
Mir Khan and Henri Lunnikivi (Tampere University, Finland); Heikki Huttunen (Tampere University of Technology, Finland); Jani Boutellier (Tampere University, Finland)



- A1.4**      **Deep Log-Likelihood Ratio Quantization**  
Marius Arvinte (University of Texas at Austin, USA); Ahmed Tewfik (University of Texas, Austin, USA); Sriram Vishwanath (University of Texas Austin, USA)
- A1.5**      **Optimized Reference Picture Selection for Light Field Image Coding**  
Ricardo Monteiro (ISCTE-IUL & Instituto de Telecomunicações, Portugal); Nuno Rodrigues (Instituto de Telecomunicações - ESTG IPLeia, Portugal); Sérgio Faria (Instituto de Telecomunicações, Portugal); Paulo Nunes (ISCTE-IUL / Instituto de Telecomunicações, Portugal)
- A1.6.**      **Gated Graph Convolutional Recurrent Neural Networks**  
Luana Ruiz, Fernando Gama and Alejandro Ribeiro (University of Pennsylvania, USA)
- A1.7**      **Waveform Optimization for FDA Radar**  
Nitsan Rubinshtein and Joseph Tabrikian (Ben-Gurion University of the Negev, Israel)
- A1.8**      **A Parallel Optimization Approach on Infinity Norm Minimization Problem**  
Tianyi Liu (Technische Universität Darmstadt, Germany); Minh Trinh Hoang (TU Darmstadt, Germany); Yang Yang (University of Luxembourg, Luxembourg); Marius Pesavento (Technische Universität Darmstadt & Merckstr. 25, Germany)
- A1.9**      **Asymptotic Karlin-Rubin's Theorem with Application to Signal Detection in a Subspace Cone**  
Sabrina Bourmani (IMT Atlantique, France); Francois-Xavier Socheleau (Telecom Bretagne, France); Dominique Pastor (IMT Atlantique, France)
- A1.10**      **On the Recursions of Robust COMET Algorithm for Convexly Structured Shape Matrix**  
Bruno Mériaux (SONDRA, CentraleSupélec, France); Chengfang Ren (CentraleSupélec, France); Arnaud Breloy (University Paris Nanterre, France); Mohammed Nabil El Korso (Paris 10 University & LEME-EA 4416, France); Philippe Forster (Universite Paris Ouest Nanterre, France); Jean-Philippe Ovarlez (ONERA & Centrale-Supelec/SONDRA, France)
- A1.11**      **Random Matrix-Improved Estimation of the Wasserstein Distance Between Two Centered Gaussian Distributions**  
Malik Tiomoko (Université Paris Saclay/ Gipsa Lab, France); Romain Couillet (Gipsa Lab/ Laboratoire des Signaux et Systèmes, Centrale Supélec, France)
- A1.12**      **A Biologically Constrained Encoding Solution for Long-Term Storage of Images onto Synthetic DNA**  
Melpomeni Dimopoulou (I3S/CNRS, France); Marc Antonini (Université de Nice Sophia Antipolis, France); Pascal Barbry (IPMC/CNRS, France); Raja Appuswamy (EURECOM, France)
- A1.13**      **Reversible Privacy Preservation Using Multi-level Encryption and Compressive Sensing**  
Mehmet Yamac (Tampere University of Technology, Finland); Mete Ahishali, Jenni Raitoharju and Nikolaos Passalis (Tampere University, Finland); Moncef Gabbouj (Tampere University of Technology, Finland); Bulent Sankur (Bogazici University, Turkey)

## Monday & Tuesday

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**20:00 - 22:30 WELCOME RECEPTION**

## TUESDAY, SEPTEMBER 3<sup>RD</sup>

### AUDITORIUM GAVIOTA

**8:30 - 9:30 OPENING AND AWARDS CEREMONY**

**9:30 - 10:30 PLENARY SPEAKERS**

### AUDITORIUM GAVIOTA

**PLEN-1: “Marked point process models in image processing. Application to Remote Sensing” EURASIP Fellow Inaugural Lecture**  
**Josiane Zerubia**  
**(INRIA Sophia Antipolis Méditerranée, France)**  
Chair: Maria S. Greco (University of Pisa, Italy)

**10:30 - 11:00 Coffee break**

**11:00 - 12:40**

### ROOM: 1

**SS3: System-Level Analysis and Optimization in Large-Scale Wireless Networks**

Organizers: Marco Di Renzo, Martin Klaus Müller, Stefan Schwarz  
Chairs: Marco Di Renzo (CentraleSupélec-University, France),  
Martin Klaus Müller (TU Wien, Austria)

**11:00**

**Coverage Analysis of Relay Assisted V2I Communication in Microcellular Urban Networks**

Blanca Ramos Elbal, Martin Klaus Müller, Stefan Schwarz and Markus Rupp  
(TU Wien, Austria)

**11:20**

**A Continuum Model for Route Optimization in Large-Scale Inhomogeneous Multi-Hop Wireless Networks**

Dene A Hedges and Justin P Coon (University of Oxford, United Kingdom (Great Britain)); Gaojie Chen (University of Leicester, United Kingdom (Great Britain))

**11:40**

## Coverage Analysis for Backscatter Communication Empowered Cellular Internet-of-Things

Syed Ali Raza Zaidi (University of Leeds, United Kingdom (Great Britain)); Maryam Hafeez (University of Huddersfield, United Kingdom (Great Britain)); Desmond McLernon (The University of Leeds, United Kingdom (Great Britain)); Moe Z. Win (Massachusetts Institute of Technology, USA)

**12:00**

## Reduced-complexity Downlink Cell-Free mmWave Massive MIMO Systems with Fronthaul Constraints

Guillem Femenias and Felip Riera-Palou (University of the Balearic Islands, Spain)

**12:20**

## On Interference Pikes in Poisson Networks

Mahin K. Atiq, Udo Schilcher and Christian Bettstetter (University of Klagenfurt, Austria)

**ROOM 2**

## ASMSP LI: Audio and Speech Source Separation

Chair: Emanuël Habets (International Audio Laboratories Erlangen, Germany)

**11:00**

## Robust and Responsive Acoustic Pairing of Devices Using Decorrelating Time-Frequency Modelling

Pablo Pérez Zarazaga, Tom Bäckström and Stephan Sigg (Aalto University, Finland)

**11:20**

## Analytical Method to Convert Circular Harmonic Expansion Coefficients for Sound Field Synthesis by Using Multipole Loudspeaker Array

Kimitaka Tsutsumi and Kenta Imaizumi (NTT Corporation, Japan); Atsushi Nakadaira (NTT, Japan); Yoichi Haneda (The University of Electro-Communications, Japan)

**11:40**

## On Room Impulse Response Measurement Using Orthogonal Periodic Sequences

Alberto Carini (Università di Trieste, Italy); Simone Orcioni and Stefania Cecchi (Università Politecnica delle Marche, Italy)

**12:00**

## Automatic Chord Estimation Based on a Frame-wise Convolutional Recurrent Neural Network with Non-Aligned Annotations

Yiming Wu (Kyoto University, Japan); Tristan Carsault (IRCAM, France); Kazuyoshi Yoshii (Kyoto University & RIKEN, Japan)

**12:20**

## A Least Squares Narrowband DOA Estimator with Robustness Against Phase Wrapping

Tobias Kabzinski (RWTH Aachen, Germany); Emanuël Habets (International Audio Laboratories Erlangen, Germany)

## ROOM 3

### BISA LI: ECG Processing

Chair: Aydin Akan (Izmir Katip Celebi University, Turkey)

11:00

#### Deep Learning Models for Denoising of ECG Signals

Corneliu T Arsene, Hujun Yin and Richard Hankins (University of Manchester, United Kingdom (Great Britain))

11:20

#### A Single ECG Lead-Based Oscillation Index for the Quantification of Periodic Breathing in Severe Heart Failure Patients

Pauline Guyot (University of Lorraine, France); El-Hadi Djermoune (CRAN, Université de Lorraine, CNRS, France); Thierry Bastogne (CRAN, France); Bruno Chenuel (EA 3450 DevAH, France)

11:40

#### Löwner-Based Tensor Decomposition for Blind Source Separation in Atrial Fibrillation ECGs

Pedro Marinho Ramos de Oliveira and Vicente Zarzoso (Université Côte d'Azur, CNRS, France)

12:00

#### Compressed Sensing for the Extraction of Atrial Fibrillation Patterns from Surface Electrocardiograms

Amina Ghrissi (Université Côte d'Azur & Laboratory I3S, France); Vicente Zarzoso (Université Côte d'Azur, CNRS, France)

12:20

#### Validation of Baseline Wander Removal and Isoelectric Correction in Electrocardiograms Using Clustering

Kjell Le, Trygve Eftestøl and Kjersti Engan (University of Stavanger, Norway); Øyunn Kleiven and Stein Ørn (Stavanger University Hospital, Norway)

## ROOM 4

### SPCN LI: Massive MIMO Systems

Chair: Xavier Mestre (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain)

11:00

#### Weighted Sum Rate Maximization for Hybrid Beamforming Design in Multi-Cell Massive MIMO OFDM Systems

Christo Kurisummoottil Thomas and Dirk Slock (EURECOM, France)

11:20

#### Channel Hardening, Favorable Equalization and Propagation in Wideband Massive MIMO

Davide Dardari (University of Bologna, Italy)

11:40

#### Fractional Programming for Energy Efficient Power Control in Uplink Massive MIMO Systems

Amare Kassaw (Technical University of Darmstadt, Germany); Dereje H. Woldegebreal (Addis Ababa University, Addis Ababa Institute of Technology, Ethiopia); Michael Fauß (Technische Universität Darmstadt, Germany); Abdelhak M Zoubir (Darmstadt University of Technology, Germany)

**12:00**

## Switch-Based Hybrid Precoding in mmWave Massive MIMO Systems

Hamed Nosrati (University of New South Wales & Data61, CSIRO, Australia); Elias Aboutanios (University of New South Wales, Australia); David B Smith (Data61 CSIRO & Australian National University, Australia); Xiangrong Wang (Beihang University, P.R. China)

**12:20**

## Efficient Distributed Processing for Large Scale MIMO Detection

Messaoud Ahmed Ouameur (Université du Québec à Trois-Rivières, Canada); Daniel Massicotte (Universite du Quebec a Trois-Rivieres, Canada)

## AUDITORIUM GAVIOTA

## TMTSP LI:

## Bayesian Techniques

Chair: Yoann Altmann (Heriot-Watt University, School of Engineering and Physical Science United Kingdom (Great Britain))

**11:00**

## Diffusion Maps Particle Filter

Lukas Forster (University of Erlangen-Nuremberg, Germany); Tal Shnitzer (Technion - Israel Institute of Technology, Israel); Alexander Schmidt (University of Erlangen-Nuremberg, Germany); Ronen Talmon (Technion - Israel Institute of Technology, Israel); Walter Kellermann (University Erlangen-Nuremberg, Germany)

**11:20**

## Bayesian Sequential Joint Signal Detection and Signal-to-Noise Ratio Estimation

Dominik Reinhard (TU Darmstadt, Germany); Michael Fauß (Technische Universität Darmstadt, Germany); Abdelhak M Zoubir (Darmstadt University of Technology, Germany)

**11:40**

## Efficient Adaptive Multiple Importance Sampling

Yousef H El-Laham (Stony Brook University (SUNY at Stony Brook), USA); Luca Martino (University of Helsinki, Finland); Víctor Elvira (IMT Lille Douai, France); Monica F. Bugallo (Stony Brook University, USA)

**12:00**

## Bayesian Robust Signal Subspace Estimation in Non-Gaussian Environment

Rayen Ben Abdallah (Laboratoire Energetique Mecanique et Electromagnetisme, University Paris Nanterre, France); Arnaud Breloy (University Paris Nanterre, France); Mohammed Nabil El Korso (Paris 10 University & LEME-EA 4416, France); David Lautru Lautru (University Paris Nanterre, Laboratoire LEME, France)

**12:20**

## Sparse Bayesian Learning for a Bilinear Calibration Model and Mismatched CRB

Kalyana Gopala (Sequans, France); Christo Kurisummoottil Thomas and Dirk Slock (EURECOM, France)

- A1.1** **A Localized No-Reference Blurriness Measure for Omnidirectional Images and Video**  
Hannes Fassold (JOANNEUM RESEARCH Forschungs Ges.m.b.H., Austria); Stefanie Wechtitsch (JOANNEUM RESEARCH, Austria)
- A1.2** **Visual Quality Analysis of Judder Effect on Head Mounted Displays**  
Saeed Mahmoudpour (Vrije Universiteit Brussel(VUB) & Imec, Belgium); Peter Schelkens (Vrije Universiteit Brussel & Imec, Belgium)
- A1.3** **Hybrid Octree-Plane Point Cloud Geometry Coding**  
Antoine Dricot (Instituto de Telecomunicações, Portugal); João Ascenso (Instituto Superior Técnico & Instituto de Telecomunicações, Portugal)
- A1.4** **A Robust Roll Angle Estimation Algorithm Based on Gradient Descent**  
Rui Fan (The Hong Kong University of Science and Technology, Hong Kong); Lujia Wang (Chinese Academy of Sciences, P.R. China); Ming Liu (The Hong Kong University of Science and Technology, Hong Kong); Ioannis Pitas (Aristotle University of Thessaloniki, Greece)
- A1.5** **A Composite Discriminator for GAN Based Video Super-Resolution**  
Xijun Wang and Alice Lucas (Northwestern University, USA); Santiago Lopez-Tapia (University of Granada, Spain); Xinyi Wu (Northwestern University, USA); Rafael Molina (Universidad de Granada, Spain); Aggelos K Katsaggelos (Northwestern University, USA)
- A1.6** **Semantic Prior Based Generative Adversarial Network for Video Super-Resolution**  
Xinyi Wu and Alice Lucas (Northwestern University, USA); Santiago Lopez-Tapia (University of Granada, Spain); Xijun Wang and Yul Hee Kim (Northwestern University, USA); Rafael Molina (Universidad de Granada, Spain); Aggelos K Katsaggelos (Northwestern University, USA)
- A1.7** **Deep Convolutional and LSTM Neural Network Architectures on Leap Motion Hand Tracking Data Sequences**  
Vassilis Katsouros (Institute for Language and Speech Processing, Greece); Maximos Kaliakatsos-Papakostas (R. C. Athena, Greece); Aggelos Pikrakis (University of Piraeus, Greece); Kosmas Kritsis (R. C. Athena & University of Piraeus, Greece)
- A1.8** **HMM-based Convolutional LSTM for Visual Scanpath Prediction**  
Ashish Verma and Debashis Sen (Indian Institute of Technology Kharagpur, India)
- A1.9** **TensMIL2: Improved Multiple Instance Classification Through Tensor Decomposition and Instance Selection**  
Thomas Papastergiou and Evangelia I Zacharaki (University of Patras, Greece); Vassilis Megalooikonomou (, Greece)

A1.10

**Linear Approximation of Deep Neural Networks for Efficient Inference on Video Data**

Bodo Rueckauer and Shih-Chii Liu (University of Zurich and ETH Zurich, Switzerland)  
 A Fast Local Mode Decision for the HEVC Intra Prediction Based on Direction Detection  
 Marcel Corrêa, Bruno Zatt, Daniel Palomino, Guilherme Correa and Luciano Agostini  
 (Federal University of Pelotas, Brazil)

**POSTER AREA 2**

**VIP PII:**

**Computational and Spectral Imaging**

Chair: Patrick Le Callet  
 (Université de Nantes, France)

A2.1

**Electromagnetic Imaging of a Dielectric Micro-Structure via Convolutional Neural Networks**

Peipei Ran (Université Paris-Saclay, France); Yingying Qin (Ecole Normale Supérieure Paris-Saclay, France); Dominique Lesselier (Laboratoire des Signaux et Systèmes CNRS-CentraleSupélec-Université Paris-Sud, France)

A2.2

**Hyperspectral Complex Domain Denoising**

Vladimir Katkovnik (Tampere University of Technology, Finland); Igor Shevkunov (Tampere University, Finland); Karen Egiazarian (Tampere University of Technology, Finland)

A4.3

**A Non-iterative Reconstruction Algorithm for Single Pixel Spectral Imaging with Side Information**

Jorge Bacca, Claudia V Correa and Henry Arguello Fuentes (Universidad Industrial de Santander, Colombia)

A2.4

**Multi-resolution Reconstruction Algorithm for Phase Retrieval in X-ray Crystallography**

Jhon Angarita, Samuel Pinilla, Hans Garcia and Henry Arguello (Universidad Industrial de Santander, Colombia)

A2.5

**Non-local Restoration of Sparse 3D Single-Photon Data**

Songmao Chen (Institute of Optics and Precision Mechanics, Chinese Academy of Science, Xi'an & University of Chinese Academy of Science (UCAS), Beijing, P.R. China); Abderrahim Halimi and Ximing Ren (Heriot-Watt University, United Kingdom (Great Britain)); Aongus McCarthy (Heriot Watt University, United Kingdom (Great Britain)); Xiuqin Su (Institute of Optics and Precision Mechanics, Chinese Academy of Science, Xi'an, P.R. China); Gerald Buller (Heriot-Watt University, United Kingdom (Great Britain)); Steve McLaughlin (Heriot Watt University, United Kingdom (Great Britain))

A2.6

**Coded Aperture Design for Super-Resolution Phase Retrieval**

Jorge Bacca, Samuel Pinilla and Henry Arguello Fuentes (Universidad Industrial de Santander, Colombia)

A2.7

## **An Adaptive Video Acquisition Scheme for Object Tracking**

Srutarshi Banerjee (Northwestern University, USA); Juan G. Serra (University of Granada, Spain); Henry Chopp, Oliver Cossairt and Aggelos K Katsaggelos (Northwestern University, USA)

A2.8

## **Subjective Evaluation of Light Field Image Compression Methods Based on View Synthesis**

Nader Bakir (IETR-INSA Rennes, France); Sid Ahmed Fezza (National Institute of Telecommunications and ICT, Algeria); Wassim Hamidouche (IETR-INSA Rennes, France); Khoulood Samrouth (Lebanese University, Lebanon); Olivier Deforges (IETR, Rennes, France)

## **POSTER AREA 3**

## **SiG-DML PI:**

## **Pattern Recognition**

Chair: Yuval Bistriz  
(Tel Aviv University, Israel)

A3.1

## **Discriminative Joint Vector and Component Reduction for Gaussian Mixture Models**

Yossi Bar-Yosef (University of Tel-Aviv, Israel); Yuval Bistriz (Tel Aviv University, Israel)

A3.2

## **Applications of Projected Belief Networks (PBN)**

Paul M Baggenstoss (Fraunhofer FKIE, Germany)

A3.3

## **Weighted Subset Selection for Fast SVM Training**

Sara Mourad (The University of Texas at Austin, USA); Ahmed Tewfik (University of Texas, Austin, USA); Haris Vikalo (The University of Texas at Austin, USA)

A3.4

## **Black-Box Decision Based Adversarial Attack with Symmetric Alpha-Stable Distribution**

Vignesh Srinivasan (Fraunhofer HHI, Germany); Ercan Engin Kuruoglu (CNR, Italy); Klaus-Robert Müller (Machine Learning Laboratory, Berlin Institute of Technology, Berlin, Germany); Wojciech Samek (Fraunhofer Heinrich Hertz Institute, Germany); Shinichi Nakajima (Technische Universität Berlin, Germany)

A3.5

## **Open-Set Recognition Using Intra-Class Splitting**

Patrick Schlachter (University of Stuttgart, Germany); Yiwen Liao (University of Stuttgart & Institute of Signal Processing and System Theory, Germany); Bin Yang (University of Stuttgart, Germany)

A3.6

## **Virtual Adversarial Training for Semi-supervised Verification Tasks**

Vahid Noroozi (University of Illinois at Chicago, USA); Sara Bahaadini (Northwestern University, USA); Lei Zheng (University of Illinois at Chicago, USA); Sihong Xie (Lehigh University, USA); Philip Yu (University of Illinois at Chicago, USA)

A3.7

## **Understanding Support Vector Machines with Polynomial Kernels**

Rikard Vinge and Tomas McKelvey (Chalmers University of Technology, Sweden)



12:40 - 13:40

Lunch break

13:40 - 15:40

ROOM 1**SS4: Advances on tensor and multi-dimensional data representation**

Organizers: Laurent Albera, Marc Castella

Chairs: Laurent Albera (Université de Rennes1 &amp; Inserm, France), Marc Castella (Institut Mines-Télécom, Télécom SudParis &amp; UMR-CNRS 5157 SAMOVAR, France)

13:40

**Tensor-Train Modeling for MIMO-OFDM Tensor Coding-And-Forwarding Relay Systems**

Yassine Zniyed (Université Paris-Sud (UPS), CNRS, CentraleSupélec, France); Remy Boyer (University of Lille &amp; CRISAL, France); André de Almeida (Universidade Federal do Ceará, Brazil); Gérard Favier (I3S, CNRS, University of Nice Sophia-Antipolis, France)

14:00

**Rank Estimation and Tensor Decomposition Using Physics-Driven Constraints for Brain Source Localization**

Nasrin Taheri (Université de Rennes 1, France); Amar Kachenoura (University of Rennes1-LTSI &amp; Inserm - UMR 1099, France); Ahmad Karfoul (Université de Rennes1 &amp; INSERM U1099, France); Xu Han (Université de Rennes 1, France); Karim Ansari-Asl (Sahid Chamran University, Iran); Isabelle Merlet (University of Rennes 1, France); Lotfi Senhadji (Université de Rennes 1 &amp; Inserm, France); Laurent Albera (Université de Rennes1 &amp; Inserm, France)

14:20

**Path-connectedness of Tensor Ranks**

Yang Qi (University of Chicago, USA); Pierre Comon (CNRS, University Grenoble Alpes, France); Lek-Heng Lim (University of Chicago, USA); Ke Ye (Chinese Academy of Science, P.R. China)

14:40

**Identifying Stable Components of Matrix/Tensor Factorizations via Low-Rank Approximation of Inter-Factorization Similarity**

Simon Van Eyndhoven and Nico Vervliet (KU Leuven, Belgium); Lieven De Lathauwer (KU Leuven Kulak, Belgium); Sabine Van Huffel (Katholieke Universiteit Leuven, Belgium)

15:00

**Probabilistic Tensor Train Decomposition**

Jesper L Hinrich and Morten Mørup (Technical University of Denmark, Denmark)

15:20

**Detecting the Rank of a Symmetric Tensor**

Arthur Marmin (CentraleSupélec, University Paris-Saclay, France); Marc Castella (Institut Mines-Télécom, Télécom SudParis &amp; UMR-CNRS 5157 SAMOVAR, France); Jean-Christophe Pesquet (CentraleSupélec, University Paris-Saclay, France)

## ROOM 2

### SS2: Music Information Processing

Organizers: Emmanouil Benetos, Bob L. Sturm, Mark B. Sandler  
Chairs: Emmanouil Benetos (Queen Mary University of London, United Kingdom (Great Britain)), Mark Sandler (Queen Mary University of London, United Kingdom (Great Britain))

13:40

#### Joint Singing Voice Separation and F0 Estimation with Deep U-Net Architectures

Andreas Jansson (City, University of London & Spotify, Inc., USA); Rachel Bittner (Spotify, USA); Sebastian Ewert (Queen Mary University of London, United Kingdom (Great Britain)); Tillman Weyde (City, University of London, United Kingdom (Great Britain))

14:00

#### The Art of Teaching Computers: The SIMSSA Optical Music Recognition Workflow System

Ichiro Fujinaga and Gabriel Vigliensoni (McGill University, Canada)

14:20

#### Spectral Visibility Graphs: Application to Similarity of Harmonic Signals

Delia Fano Yela (Queen Mary University of London, United Kingdom (Great Britain)); Dan Stowell (Queen Mary - University of London, United Kingdom (Great Britain)); Mark Sandler (Queen Mary University of London, United Kingdom (Great Britain))

14:40

#### Improving Singing Voice Separation Using Deep U-Net and Wave-U-Net with Data Augmentation

Alice Cohen-Hadria and Axel Roebel (IRCAM, France); Geoffroy Peeters (LTCI, Télécom ParisTech, University Paris-Saclay, France)

15:00

#### Data Augmentation for Drum Transcription with Convolutional Neural Networks

Celine Jacques and Axel Roebel (IRCAM, France)

15:20

#### Temporal Convolutional Networks for Musical Audio Beat Tracking

Matthew E P Davies (INESC TEC, Portugal); Sebastian Böck (Austrian Research Institute for Artificial Intelligence, Austria)

## ROOM 3

### BISA LII: Signal Processing for MRI Signaling

Chair: Joerg Keller (FernUniversitaet in Hagen, Germany)

13:40

#### fMRI BOLD Signal Decomposition Using a Multivariate Low-Rank Model

Hamza Cherkaoui (CEA/NeuroSpin & INRIA Parietal, France); Thomas Moreau (INRIA Saclay, France); Abderrahim Halimi (Heriot-Watt University, United Kingdom (Great Britain)); Philippe Ciuciu (CEA/NeuroSpin & INRIA Saclay, France)

14:00

#### Online Dictionary Learning for Single-Subject fMRI Data Unmixing

Argheesh Bhanot, Céline Meillier, Fabrice Heitz and Laura Harsan (ICube UMR 7357, Université de Strasbourg, CNRS, France)

**14:20**

## Improved Regularized Reconstruction for Simultaneous Multi-Slice Cardiac MRI T1 Mapping

Omer Burak Demirel (University of Minnesota & Center for Magnetic Resonance Research, USA); Sebastian Weingaertner (University of Minnesota, USA); Steen Moeller (Center for Magnetic Resonance Research, University of Minnesota, USA); Mehmet Akcakaya (University of Minnesota, USA)

**14:40**

## A Quality of Recognition Case Study: Texture-based Segmentation and MRI Quality Assessment

Rafael Rodrigues (Instituto de Telecomunicações & Universidade da Beira Interior, Portugal); Antonio M. G. Pinheiro (Instituto de Telecomunicações, Universidade da Beira Interior, Portugal)

**15:00**

## Rethinking Sampling in Parallel MRI: A Data-Driven Approach

Baran Gözcü and Thomas Sanchez (EPFL, Switzerland); Volkan Cevher (Ecole Polytechnique Federale de Lausanne, Switzerland)

**15:20**

## Investigating Time-Varying Brain Connectivity with Functional Magnetic Resonance Imaging Using Sequential Monte Carlo

Pierfrancesco Ambrosi (University of Pisa, Italy); Mauro Costagli (IRCCS Fondazione Stella Maris, Italy); Ercan Engin Kuruoglu (ISTI-CNR); Laura Biagi (Stella Maris Scientific Institute, Pisa, Italy); Guido Buonincontri and Michela Tosetti (IRCCS Fondazione Stella Maris, Italy)

**ROOM 4**

## SiG-DML LI:

## Deep Learning Applications

Chair: Valery Naranjo (Polytechnic University of Valencia, Spain)

**13:40**

## Power Distribution Insulators Classification Using Image Hybrid Deep Learning

Eduardo Simas Filho (Federal University of Bahia, Brazil); Ricardo Prates (Universidade Federal do Vale do São Francisco & Universidade Federal da Bahia, Brazil); Rodrigo Pereira Ramos (UNIVASF - Universidade Federal do Vale do São Francisco, Brazil); Jaime Cardoso (INESC-TEC - FEUP, Brazil)

**14:00**

## Monaural Speech Separation with Deep Learning Using Phase Modelling and Capsule Networks

Toby Staines, Tillman Weyde and Oleksandr Galkin (City, University of London, United Kingdom (Great Britain))

**14:20**

## Multimodal Image Super-resolution via Deep Unfolding with Side Information

Iman Marivani (Vrije Universiteit Brussel & Imec, Belgium); Evaggelia Tsiligianni, Bruno Cornelis and Nikos Deligiannis (Vrije Universiteit Brussel, Belgium)

## Tuesday

14:40

### Large-scale Pollen Recognition with Deep Learning

Andre R. de Geus and Celia Barcelos (Federal University of Uberlândia, Brazil);  
Marcos Aurélio Batista and Sérgio da Silva (Federal University of Goiás, Brazil)

15:00

### Real-Time Hand Gesture Recognition Model Using Deep Learning Techniques and EMG Signals

Edison Chung and Marco E. Benalcázar (Escuela Politécnica Nacional, Ecuador)

15:20

### Deep Learning Based Localization of Near-Field Sources with Exact Spherical Wavefront Model

Wenyi Liu, Jingmin Xin, Weiliang Zuo, Jie Li and Nanning Zheng (Xi'an Jiaotong University, P.R. China); Akira Sano (Keio University, Japan)

## AUDITORIUM GAVIOTA

## VIP LI: Image Enhancement

Chair: Frederic Dufaux (CNRS, France)

13:40

### Tone Mapped HDR Images Contrast Enhancement Using Piecewise Linear Perceptual Transformation

Ba Chien Thai (The University of Danang & University of Science and Technology, Vietnam); Anissa Mokraoui (Université Paris 13, Sorbone Paris Cité & Institut Galilée, L2TI, France)

14:00

### Loss Functions for Denoising Compressed Images: a Comparative Study

Thomas Oberlin (University of Toulouse, France); François Malgouyres (IMT, Université Paul Sabatier, France); Jin-Yi Wu (University of Toulouse, France)

14:20

### iTM-Net: Deep Inverse Tone Mapping Using Novel Loss Function Based on Tone Mapping Operator

Yuma Kinoshita and Hitoshi Kiya (Tokyo Metropolitan University, Japan)

14:40

### IEST: Interpolation-Enhanced Shearlet Transform for Light Field Reconstruction Using Adaptive Separable Convolution

Yuan Gao (Kiel University, Germany); Reinhard Koch (University of Kiel, Germany); Robert Bregović and Atanas Gotchev (Tampere University of Technology, Finland)

15:00

### Audio-Visual Speech Enhancement Using Hierarchical Extreme Learning Machine

Tassadaq Hussain (Institute of Information Science, Academia Sinica & National Chengchi University, Taiwan); Yu Tsao (Research Center for Information Technology Innovation, Academia Sinica, Taiwan); Hsin-Min Wang (Academia Sinica, Taiwan); Jia-Ching Wang (National Central University, Taiwan); Sabato M Siniscalchi (Kore University of Enna, Italy); Wen-Hung Liao (National Chengchi University, Taiwan)

15:20

### Optimized Reference Picture Selection for Light Field Image Coding

Ricardo Monteiro (ISCTE-IUL & Instituto de Telecomunicações, Portugal); Nuno Rodrigues (Instituto de Telecomunicações - ESTG IPLeia, Portugal); Sérgio Faria (Instituto de Telecomunicações, Portugal); Paulo Nunes (ISCTE-IUL / Instituto de Telecomunicações, Portugal)

## POSTER AREA 1

## TMTSP PI:

## Compressed Sensing and Sparse Modeling

Chair: André Ferrari (Université de Nice Sophia-Antipolis, France)

- A1.1** **A New Algorithm for Dictionary Learning Based on Convex Approximation**  
 Javad Parsa (Sharif University of Technology, Tehran, IRAN, Iran); Mostafa Sadeghi (Inria, Grenoble, France); Massoud Babaie-Zadeh (Sharif University of Technology, Iran); Christian Jutten (GIPSA-Lab, France)
- A1.2** **A Novel Compressive Sensing Scheme Under the Variational Bayesian Framework**  
 Vangelis P. Oikonomou (CERTH, Greece); Spiros Nikolopoulos (ITI-CERTH, Greece); Ioannis Kompatsiaris (Centre for Research and Technology Hellas, Greece)
- A1.3** **State Space Models with Dynamical and Sparse Variances, and Inference by EM Message Passing**  
 Federico Wadehn, Hans-Andrea Loeliger and Thilo Weber (ETH Zurich, Switzerland)
- A1.4** **Robust Compressive Spectral Image Recovery Algorithm Using Dictionary Learning and Transform Tensor SVD**  
 Yesid Fonseca (Universidad Industrial, Colombia); Tatiana Gelvez and Henry Arguello Fuentes (Universidad Industrial de Santander, Colombia)
- A1.5** **Random Gabor Multipliers for Compressive Sensing: A Simulation Study**  
 Shristi Rajbamshi, Georg Tauböck, Peter Balazs and Luís Daniel Abreu (Austrian Academy of Sciences, Austria)
- A1.6** **Impact Sounds Classification for Interactive Applications via Discriminative Dictionary Learning**  
 Christos Tzagkarakis (Foundation for Research and Technology - Hellas (FORTH), Greece); Nikolaos Stefanakis (Foundation of Research and Technology Hellas, Greece); George Tzagkarakis (Foundation for Research and Technology-Hellas (FORTH), Greece & University of Bordeaux (IRGO), France)
- A1.7** **Secure Dictionary Learning for Sparse Representation**  
 Takayuki Nakachi and Yukihiro Bandoh (NTT, Japan); Hitoshi Kiya (Tokyo Metropolitan University, Japan)
- A1.8** **Convex Optimization Based Sparse Learning over Networks**  
 Ahmed Zaki (KTH Royal Institute of Technology, Sweden); Saikat Chatterjee (KTH - Royal Institute of Technology & Communication Theory Lab, Sweden)
- A1.9** **Compressive Chirp Transform for Estimation of Chirp Parameters**  
 Luay Ali Al Irkhis (Wright State University, USA); Arnab Shaw (9782 Country Creek Way, USA)
- A1.10** **Malware Identification with Dictionary Learning**  
 Paul Irofti and Andra Băltoiu (University of Bucharest, Romania)

## POSTER AREA 2

### TMTSP PII: Optimization methods

Chair: Patrick L. Combettes (North Carolina State University, USA)

- A2.1** **Improving FISTA's Speed of Convergence via a Novel Inertial Sequence**  
Paul Rodriguez (Pontificia Universidad Catolica del Peru, Peru)
- A2.2** **Adaptive Localized Cayley Parametrization Technique for Smooth Optimization over the Stiefel Manifold**  
Keita Kume and Isao Yamada (Tokyo Institute of Technology, Japan)
- A2.3** **A Parallel Optimization Approach on Infinity Norm Minimization Problem**  
Tianyi Liu (Technische Universität Darmstadt, Germany); Minh Trinh Hoang (TU Darmstadt, Germany); Yang Yang (University of Luxembourg, Luxembourg); Marius Pesavento (Technische Universität Darmstadt & Merckstr. 25, Germany)
- A2.4** **Discrete-Valued Vector Reconstruction by Optimization with Sum of Sparse Regularizers**  
Ryo Hayakawa (Kyoto University, Japan); Kazunori Hayashi (Osaka City University, Japan)
- A2.5** **FISTA: Achieving a Rate of Convergence Proportional to  $K^{-3}$  for Small / Medium Values of  $k$**   
Gustavo Silva and Paul Rodriguez (Pontificia Universidad Catolica del Peru, Peru)
- A2.6** **Exact Multiplicative Factor Updates for Convolutional Beta-NMF in 2D**  
Pedro Villasana and Stanislaw Gorlow (Dolby Laboratories, Sweden)
- A2.7** **Region-based Relaxations to Accelerate Greedy Approaches**  
Clément Dorffer (ENSTA Bretagne, France); Cédric Herzet (INRIA Rennes, France); Angélique Drémeau (ENSTA Bretagne, France)
- A2.8** **Fully Proximal Splitting Algorithms in Image Recovery**  
Patrick L. Combettes (North Carolina State University, USA); Lilian E. Glaudin (Sorbonne Université, France)

## POSTER AREA 3

### SPMuS PI: Radar

Chair: Angelo Coluccia (University of Salento, Italy)

- A3.1** **Low-Complexity Optimization for Direction-of-Arrival Estimation via Approximate Message Passing**  
Xinyu Zhang, Kai Huo, Shuanghui Zhang, Yongxiang Liu, Weidong Jiang and Xiang Li (National University of Defense Technology, P.R. China)
- A3.2** **Semidefinite Programming for MIMO Radar Target Localization Using Bistatic Range Measurements**  
Hongyi Wang, Zhang Bingbing, Zheng Liming and Jianfei Wu (College of Electronic Science and Technology, National University of Defense Technology, Changsha, China)

- A3.3** **Waveform Optimization for FDA Radar**  
Nitsan Rubinshtein and Joseph Tabrikian (Ben-Gurion University of the Negev, Israel)
- A3.4** **Spatio-Temporal Waveform Design in Active Sensing Systems with Multilayer Targets**  
Ali Kariminezhad and Aydin Sezgin (RUB, Germany)
- A3.5** **An Adversarial Super-Resolution Remedy for Radar Design Trade-offs**  
Karim Armanious (Institute of Signal Processing and System Theory, Germany); Sherif Abdulatif (University of Stuttgart, Germany); Fady Aziz and Urs Schneider (Fraunhofer IPA, Germany); Bin Yang (University of Stuttgart, Germany)
- A3.6** **Vector-Valued KLMS Based Multiple Target Range and Velocity Estimation Using IEEE 802.11P Waveform for Autonomous Vehicle**  
Uday Singh (Indian Institute of Technology Indore, India); Rangeet Mitra (Indian Institute of Information Technology SriCity, India); Vimal Bhatia (Indian Institute of Technology Indore, India); Amit Mishra (University of Cape Town, South Africa)
- A3.7** **Fast Direct Detection of Accelerating Radar Targets**  
Songsri Sirianunpiboon, Stephen D Howard and Stephen D Elton (Defence Science and Technology Group, Australia)

## 15:40 - 16:10 Coffee break

## 16:10 - 17:50

### ROOM 1

#### **SS10: Signal processing for secure and reliable localization using terrestrial networks**

Organizers: José A. del Peral-Rosado, Giuseppe Destino, Felix Antreich, Gonzalo Seco-Granados  
Chair: José A. López-Salcedo (Universitat Autònoma de Barcelona, Spain)

### 16:10

#### **LTE Ranging Measurement Using Uplink Opportunistic Signals and the SAGE Algorithm**

Alessandro Pin (Università di Udine, Italy); Roberto Rinaldo (University of Udine, Italy); Andrea M Tonello (University of Klagenfurt, Austria); Chris Marshall and Marco Driusso (U-blox UK, Italy); Alessandro Biason (U-blox Italy, Italy); Andrea Dalla Torre (U-blox Italia, Italy)

### 16:30

#### **Radio Positioning and Tracking of High-Speed Devices in 5G NR Networks: System Concept and Performance**

Jukka Talvitie, Mike Koivisto and Toni A Levanen (Tampere University, Finland); Tero Ihalainen (Nokia Bell Labs, Finland); Kari Pajukoski (Nokia, Bell-Labs, Finland); Mikko Valkama (Tampere University of Technology, Finland)

### 16:50

#### **Non-Centralized Navigation for Source Localization by Cooperative UAVs**

Anna Guerra and Davide Dardari (University of Bologna, Italy); Petar M. Djurić (Stony Brook University, USA)

## Tuesday

17:10

### Heterogeneous Network Localization with a Distributed Phased Array Composed of Cooperative Vehicles

Siwei Zhang, Robert Pöhlmann and Armin Dammann (German Aerospace Center (DLR), Germany)

17:30

### Learning Methods for RSSI-based Geolocation: A Comparative Study

Kevin Elgui (Télécom ParisTech, France); Pascal Bianchi (Telecom Paristech - LTCI, France); François Portier (Télécom ParisTech, LTCI, France); Olivier Isson (Sigfox, France)

## ROOM 2

### ASMSP LII: Speaker and Speech Recognition

Chair: Jesper Rindom Jensen (Aalborg University, Denmark)

16:10

### CNN-based Multichannel End-to-End Speech Recognition for Everyday Home Environments

Nelson Yalta (Waseda University, Japan); Shinji Watanabe (Johns Hopkins University, USA); Takaaki Hori (NTT Corporation, Japan); Kazuhiro Nakadai (Honda Research Institute Japan Co., Ltd. & Tokyo Institute of Technology, Japan); Tetsuya Ogata (Waseda University, Japan)

16:30

### Lip-Reading with Limited-Data Network

Adriana Fernandez-Lopez (Universitat Pompeu Fabra, Spain); Federico M Sukno (Pompeu Fabra University, Spain)

16:50

### Context-Aware Neural Voice Activity Detection Using Auxiliary Networks for Phoneme Recognition, Speech Enhancement and Acoustic Scene Classification

Ryo Masumura and Kiyooki Matsui (NTT Corporation, Japan); Yuma Koizumi (NTT Corporation & NTT Media Intelligence Laboratories, Japan); Takaaki Fukutomi (NTT Corporation, Japan); Takanobu Oba (NTT Communication Science Laboratories, Japan); Yushi Aono (NTT Corporation, Japan)

17:10

### DNN Speaker Embeddings Using Autoencoder Pre-Training

Umair Khan (Universitat Politècnica de Catalunya, Spain); Javier Hernando (Technical University of Catalonia, Spain)

17:30

### Energy Separation Algorithm Based Spectrum Estimation for Very Short Duration of Speech

Hemant A. Patil (Dhirubhai Ambani Institute of Information and Communication Technology, India); Srikant Viswanath (DA-IICT, Gandhinagar, India)

## ROOM 3

### DIS LI: Design and Implementation of Signal Processing Methods

Chair: Gabriel Falcao (Instituto de Telecomunicações, University of Coimbra, Portugal)



**16:10**

**Extending Architecture Modeling for Signal Processing Towards GPUs**

Saman Payvar and Jani Boutellier (Tampere University, Finland); Antoine Morvan (Univ Rennes, INSA Rennes, CNRS, IETR, France); Claudio Rubattu (IETR/INSA Rennes and UNISS, Italy); Maxime Pelcat (IETR/INSA Rennes - Institut Pascal, France)

**16:30**

**A Low-Computation-Cycle Design of Input-Decimation Technique for RIDFT Algorithm**

Chih-Feng Wu (National Chin-Yi University of Technology, Taiwan); Chun-Hung Chen (National Taiwan University, Taiwan); Muh-Tian Shiue (Nation Central University, Taiwan)

**16:50**

**Real-Time Prototyping of Matlab-Java Code Integration for Water Sensor Networks Applications**

Stelios Roubakis (Foundation for Research and Technology-Hellas, Greece); George Tzagkarakis (Foundation for Research and Technology-Hellas (FORTH), Greece & University of Bordeaux (IRGO), France); Panagiotis Tsakalides (FORTH-ICS and University of Crete, Greece)

**17:10**

**Compressive Digital Receiver: First Results on Sensitivity, Dynamic Range and Instantaneous Bandwidth Measurements**

Ali Bugra Korucu and Yasar Kemal Alp (ASELSAN Inc., Turkey); Gokhan Gok (Hacettepe University, Turkey); Orhan Arikan (Bilkent University, Turkey)

**17:30**

**Comparing Optimization Methods of Neural Networks for Real-time Inference**

Mir Khan and Henri Lunnikivi (Tampere University, Finland); Heikki Huttunen (Tampere University of Technology, Finland); Jani Boutellier (Tampere University, Finland)

**ROOM 4**

**VIP LII: Multimedia Content Analysis**

Chair: Fernando Pérez-González (University of Vigo, Spain)

**16:10**

**Compression Efficiency and Computational Cost Comparison Between AV1 and HEVC Encoders**

Isis Bender (Federal University Pelotas (UFPEL), Brazil); Daniel Palomino, Luciano Agostini, Guilherme Correa and Marcelo Porto (Federal University of Pelotas, Brazil)

**16:30**

**Improving the Performance of Lightweight CNN Models Using Minimum Enclosing Ball Regularization**

Maria Tzelepi and Anastasios Tefas (Aristotle University of Thessaloniki, Greece)

**16:50**

**Collecting, Analyzing and Predicting Socially-Driven Image Interestingness**

Eloise Berson (Supelec, France); Ngoc Q. K. Duong and Claire-Hélène Demarty (Technicolor, France)

## Tuesday

17:10

### Face-aware Saliency Estimation Model for 360 Images

Pramit Mazumdar and Giuliano Arru (University of Roma Tre, Italy); Marco Carli (Università degli Studi Roma TRE, Italy); Federica Battisti (Università degli Studi Roma Tre, Italy)

17:30

### A Novel Resynchronization Procedure for Hand-Lips Fusion Applied to Continuous French Cued Speech Recognition

Li Liu (Ryerson University, Canada); Gang Feng (Gipsa lab, France); Denis Beautemps (Gipsa-lab, France); Xiao-Ping (Steven) Zhang (Ryerson University, Canada)

## AUDITORIUM GAVIOTA

## TMTSP LII:

## Detection Methods

Chair: Abdelhak M Zoubir (Darmstadt University of Technology, Germany)

16:10

### Two-Channel Passive Detection Exploiting Cyclostationarity

Stefanie Horstmann (University of Paderborn, Germany); David Ramírez (Universidad Carlos III de Madrid, Spain); Peter J. Schreier (Universitaet Paderborn, Germany)

16:30

### Source Enumeration in Non-White Noise and Small Sample Size via Subspace Averaging

Vaibhav Garg and Ignacio Santamaria (University of Cantabria, Spain)

16:50

### Kernel Based Online Change Point Detection

Ikram Bouchikhi (Université côte d'Azur, France); André Ferrari and Cédric Richard (Université de Nice Sophia-Antipolis, France); Anthony Bourrier and Marc Bernot (Thales Alenia Space, France)

17:10

### ExPACO: Detection of an Extended Pattern Under Nonstationary Correlated Noise by Patch Covariance Modeling

Olivier Flasseur and Loic Denis (Université de Lyon, France); Eric Thiébaud (Centre de Recherche Astrophysique de Lyon, France); Thomas Olivier (Université de Lyon, France); Corinne Fournier (Laboratoire Hubert Curien, France)

17:30

### Fast Surface Detection in Single-Photon Lidar Waveforms

Julian Tachella and Yoann Altmann (Heriot-Watt University, School of Engineering and Physical Sciences, United Kingdom (Great Britain)); Jean-Yves Tournet (University of Toulouse & ENSEEIHT, France); Steve McLaughlin (Heriot Watt University, United Kingdom (Great Britain))

## POSTER AREA 1

## OSPA PI:

## Other Signal Processing Areas

Chair: Carlos J Escudero (University of A Coruña, Spain)

A1.1

### Estimation of Measurement-Noise Variance for Variable-Step-Size NLMS Filters

Tilo Strutz (Leipzig University of Telecommunications (HfTL), Germany)

- A1.2** **NLOS Classification Based on RSS and Ranging Statistics Obtained from Low-Cost UWB Devices**  
Valentin Barral, Carlos J Escudero and José A. García-Naya  
(University of A Coruña, Spain)
- A1.3** **Multiscale Permutation Entropy: Statistical Characterization on Autoregressive and Moving Average Processes**  
Antonio Davalos (Universite d'Orleans, France); Meryem Jabloun, Philippe Ravier and Olivier Buttelli (Université d'Orléans, France)
- A1.4** **Compensating for Object Variability in DNN-HMM Object-Centered Human Activity Recognition**  
Yikai Peng, Peter Jancovic and Martin Russell (University of Birmingham, United Kingdom (Great Britain))
- A1.5** **Non-Destructive Prediction of Pork Meat Degradation Using a Stacked Autoencoder Classifier on Hyperspectral Images**  
Betty Gallo (Catholic University of Pelotas, Brazil); Sérgio José Melo de Almeida (Universidade Católica de Pelotas, Brazil); Jose Carlos Moreira Bermudez (Federal University of Santa Catarina, Brazil); Jie Chen (Northwestern Polytechnical University, P.R. China); Cédric Richard (Université de Nice Sophia-Antipolis, France)
- A1.6** **Graphical Schemes Designed to Display and Study the Long-Term Variations of Schumann Resonance**  
Jesus Rodriguez-Camacho, Juan Francisco Gómez-Lopera, Alfonso Salinas, Jesús Fornieles-Callejón, Jorge Portí and David Blanco (University of Granada, Spain); María C. Carrion (Dpto Fisica Aplicada, Facultad de Ciencias, University of Granada, Spain); Enrique Navarro Camba (University of Valencia, Spain)
- A1.7** **An Environment for Gestural Interaction with 3D Virtual Musical Instruments as an Educational Tool**  
Christos Garoufis and Athanasia Zlatintsi (National Technical University of Athens, Greece); Kosmas Kritsis (R. C. Athena & University of Piraeus, Greece); Panagiotis Filntisis (NTUA, Greece); Vassilis Katsouros (Institute for Language and Speech Processing, Greece); Petros Maragos (National Technical University of Athens, Greece)
- A1.8** **GPR Antenna Localization Based on A-Scans**  
Evangelos Skartados (Centre for Research and Technology Hellas, Information Technologies Institute (CERTH/ITI), Greece); Andreas Kargakos, Efthimios Tsiogas and Ioannis Kostavelis (Centre for Research and Technology Hellas, Greece); Dimitrios Giakoumis (CERTH-ITI, Greece); Dimitrios Tzovaras (Centre for Research and Technology Hellas)
- A1.9** **Scheduling Moldable Parallel Streaming Tasks on Heterogeneous Platforms with Frequency Scaling**  
Sebastian Litzinger (FernUniversität in Hagen, Germany); Joerg Keller (FernUniversitaet in Hagen, Germany); Christoph W Kessler (Linköping University, Sweden)

## POSTER AREA 2

### BISA PI:

#### Biomedical signal and image processing

Chair: Saeid Sanei (Nottingham Trent University & Imperial College London, United Kingdom (Great Britain))

A2.1

#### Imaging Experiment of Multi-Pinhole Based X-Ray Fluorescence Computed Tomography Using Rat Head Phantoms

T. Sasaya, Tsuyochi Oouchi and Tetsuya Yuasa (Yamagata University, Japan); Seung-Jun Seo, Jae-Geun Jeon and Jong-Ki Kim (Catholic University of Daegu, Korea); Naoki Sunaguchi (Nagoya University, Japan); K. Hyodo (High Energy Accelerator Organization, KEK, Japan); Tsutomu Zeniya (Hirosaki University, Japan)

A2.2

#### Derivation of Respiratory Effort from Photoplethysmography

Delaram Jarchi (University of Essex, United Kingdom (Great Britain)); Saeid Sanei (Nottingham Trent University & Imperial College London, United Kingdom (Great Britain))  
Advancing Speech Recognition with No Speech or with Noisy Speech  
Gautam Krishna, Co Tran and Mason Carnahan (UT Austin, USA); Ahmed Tewfik (University of Texas, Austin, USA)

A2.3

#### Sequential Peak Detection for Flow Cytometry

Gökhan Gül, Sabine Alebrand, Michael Bassler and Jörn Wittek (Fraunhofer IMM, Germany)

A2.4

#### Multi-Exponential Relaxation Times Maps Reconstruction and Unsupervised Classification in Magnitude Magnetic Resonance Imaging

Christian EL Hajj (Irstea and LS2N, Rennes and Nantes); Saïd Moussaoui (LS2N, Nantes); Guylaine Collewet and Maja Musse (Irstea, Rennes)

A2.5

#### Combining Evidences from Variable Teager Energy Source and Mel Cepstral Features for Classification of Normal vs. Pathological Voices

Hemant A. Patil (Dhirubhai Ambani Institute of Information and Communication Technology, India)

A2.6

#### Fast Alignment of Limited Angle Tomograms by Projected Cross Correlation

Ricardo M. Sánchez (Max Planck Institute for Biophysics & Goethe University, Germany); Rudolf Mester (Goethe University, Frankfurt & VSI Lab, Germany); Mikhail Kudryashev (Max Planck Institute for Biophysics, Germany)

A2.7

#### Identification of Alzheimer's Disease Using Non-linguistic Audio Descriptors

Chitrallekha Bhat and Sunil Kumar Kopparapu (Tata Consultancy Services, India)

## POSTER AREA 3

### BISA PII:

#### Bio-inspired signal and image processing

Chair: Ercan Engin Kuruoglu (CNR, Italy)

- A3.1** **A Novel Design Method for Digital FIR/IIR Filters Based on the Shuffle Frog-Leaping Algorithm**  
Daniel Jiménez-Galindo (Universidad de Valladolid, Spain); Pablo Casaseca-de-la-Higuera (ETSI Telecomunicación, Universidad de Valladolid, Spain); Luis M. San-José-Revuelta (University of Valladolid, Spain)
- A3.2** **Efficiency of the Bio-Inspired Leaky Integrate-and-Fire Neuron for Signal Coding**  
Effrosyni Doutsis (Foundation for Research and Technology - Hellas (FORTH) & Institute of Computer Science (ICS), Greece); Lionel Fillatre (Université Côte d'Azur, France); Marc Antonini (Université de Nice Sophia Antipolis, France)
- A3.3** **Efficiency of the Memory Polynomial Model in Realizing Digital Twins for Gait Assessment**  
Javier Conte Alcaraz (Leibniz Universität Hannover, Germany); Sanam Moghaddamnia (Türkisch-Deutsche Universität, Turkey); Martin Fuhrwerk (RFmondial GmbH, Germany); Jürgen Peissig (Leibniz Universität Hannover, Germany)
- A3.4** **Neuro-inspired Compression of RGB Images**  
Effrosyni Doutsis (Foundation for Research and Technology - Hellas (FORTH) & Institute of Computer Science (ICS), Greece); George Tzagkarakis (Foundation for Research and Technology-Hellas (FORTH), Greece & University of Bordeaux (IRGO), France); Panagiotis Tsakalides (FORTH-ICS and University of Crete, Greece)
- A3.5** **A Probabilistic Method to Find and Visualize Distinct Regions in Protein Sequences**  
Morteza Hosseini (IEETA, University of Aveiro, Portugal); Diogo Pratas and Armando J Pinho (University of Aveiro, Portugal)
- A3.6** **Detecting Higher Order Genomic Variant Interactions with Spectral Analysis**  
David Uminsky (University of San Francisco, USA); Mario Banuelos (California State University, Fresno, USA); Lillian González-Albino (University of Puerto Rico, Río Piedras, USA); Rosa Garza (California State University, Monterey Bay, USA); Sylvia Akueze Nwakanma (Pomona College, USA)
- A3.7** **Variational Bayes Color Deconvolution with a Total Variation Prior**  
Miguel Vega and Javier Mateos (University of Granada, Spain); Rafael Molina (Universidad de Granada, Spain); Aggelos K Katsaggelos (Northwestern University, USA)
- A3.8** **A Robust and Sequential Approach for Detecting Gait Asymmetry Based on Radar Micro-Doppler Signatures**  
Ann-Kathrin Seifert (Technische Universität Darmstadt, Germany); Dominik Reinhard (TU Darmstadt, Germany); Abdelhak M Zoubir (Darmstadt University of Technology, Germany); Moeness G. Amin (Villanova University, USA)

**18:00 - 19:00**

**AUDITORIUM GAVIOTA**

**3MT: Three Minutes Thesis (3MT) contest**

## Tuesday & Wednesday

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**20:00 - 22:30**

**Visit to the Aquarium Finisterrae**

## WEDNESDAY, SEPTEMBER 4<sup>TH</sup>

**9:00 - 10:00**

**PLENARY SPEAKERS**

**AUDITORIUM ARAO**

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**PLEN-2:**

**"Relative smoothness:  
new paradigm in Convex Optimization"**

**Yurii Nesterov (Center for Operations Research  
and Econometrics (CORE), Université  
Catholique de Louvain (UCL), Belgium)**

Chair: Marius Pesavento (Technische Universität  
Darmstadt & Merckstr. 25, Germany)

**10:00 - 10:30**

**Coffee break**

**10:30 - 12:10**

**ROOM 1**

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**SPCN LII:**

**Low-Complexity Tranceiver Techniques**

Chair: Carlos Mosquera (University of Vigo, Spain)

**10:30**

**Reduced Complexity Maximum Likelihood Detector for DFT-s-SEFDM  
Systems**

Tong Wu (University College London(UCL), United Kingdom (Great Britain)); Ryan  
C Grammenos (University College London (UCL), United Kingdom (Great Britain))

**10:50**

**Low-Complexity Switching Network Design for Hybrid Precoding in  
mmWave MIMO Systems**

Francesc Molina (Universitat Politècnica de Catalunya, Spain); Jordi Borràs  
(Technical University of Catalonia, Spain)

**11:10**

**Low Complexity Robust Adaptive Beamformer Based on Parallel RLMS and  
Kalman RLMS**

Ghattas Akkad and Ali Mansour (ENSTA Bretagne, France); Bachar A. ElHassan  
(Lebanese University, Faculty of Engineering, Branch1 & order of Engineers and  
Architects - Tripoli, Lebanon); Jalal Abdulsayed Srar (Misrata University, Libya);  
Mohamad Najem (Lebanese International University, Lebanon); Frédéric Le Roy  
(ENSTA Bretagne, France)

**11:30**

**Low-Complexity 2-Coordinates Descent for Near-Optimal MMSE Soft-Output Massive MIMO Uplink Data Detection**

Pascal Seidel, Steffen Paul and Jochen Rust (University of Bremen, Germany)

**11:50**

**Low-Complexity Hybrid Transceivers for Uplink Multiuser mmWave MIMO by User Clustering**

Darian Pérez-Adán (Universidade da Coruña, Spain); José P González-Coma, Óscar Fresnedo and Luis Castedo (University of A Coruña, Spain)

**ROOM 2**

**ASMSP LIII: Artificial Neural Networks in Audio Signal Processing**

Chair: Sharon Gannot (Bar-Ilan University, Israel)

**10:30**

**Automatic Playlist Generation Using Convolutional Neural Networks and Recurrent Neural Networks**

Rosilde Tatiana Irene, Clara Borrelli, Massimiliano Zanoni, Michele Buccoli and Augusto Sarti (Politecnico di Milano, Italy)

**10:50**

**The Receptive Field as a Regularizer in Deep Convolutional Neural Networks for Acoustic Scene Classification**

Khaled Koutini (Johannes Kepler University Linz, Austria); Hamid Eghbal-zadeh (Johannes Kepler University Linz & LIT AI lab, Austria); Matthias Dorfer (Johannes Kepler University, Austria); Gerhard Widmer (Johannes Kepler University Linz, Austria)

**11:10**

**Multi-scale Aggregation of Phase Information for Complexity Reduction of CNN Based DOA Estimation**

Soumitro Chakrabarty and Emanuël Habets (International Audio Laboratories Erlangen, Germany)

**11:30**

**Deep Neural Network Based Poetic Meter Classification Using Musical Texture Feature Fusion**

Rajeev Rajan (College of Engineering, Thiruvananthapuram, India); Anu Raju (Rajiv Gandhi Institute of Technology, Kottayam, India)

**11:50**

**Cauchy Multichannel Speech Enhancement with a Deep Speech Prior**

Mathieu Fontaine (INRIA & University of Lorraine, France); Aditya Arie Nugraha (Center for Advanced Intelligence Project (AIP), RIKEN, Japan); Roland Badeau (LTCI, Télécom Paris, Institut Polytechnique de Paris, France); Kazuyoshi Yoshii (Kyoto University & RIKEN, Japan); Antoine Liutkus (Inria, LIRMM, University of Montpellier, France)

**ROOM 3**

**BISA LIII: Deep Learning for Biomedical Applications**

Chair: Maarten De Vos (University of Oxford, United Kingdom (Great Britain))

# Wednesday

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**10:30**

## **Surrogate Rehabilitative Time Series Data for Image-based Deep Learning**

Tracey Lee (Singapore Polytechnic & Monash University, Singapore); Saeid Sanei (Nottingham Trent University & Imperial College London, United Kingdom (Great Britain)); Kee Hao Leo (Nanyang Technological University, Singapore); Eileen Kuah (University of Glasgow, Singapore); Effie Chew (National University Hospital, Singapore); Ling Zhao (Senior Therapist, Singapore)

**10:50**

## **On the Segmentation of Plantar Foot Thermal Images with Deep Learning**

Asma Bougrine (University of Orleans & Prisme Laboratory, France); Rachid Harba and Raphael Canals (University of Orleans, France); Roger Lédée (University of Orléans, France); Meryem Jabloun (Université d'Orléans, France)

**11:10**

## **Deep Transfer Learning for Single-Channel Automatic Sleep Staging with Channel Mismatch**

Huy Phan (University of Kent, United Kingdom (Great Britain)); Oliver Chén (University of Oxford, United Kingdom (Great Britain)); Philipp Koch (University of Lübeck, Germany); Alfred Mertins (Institute for Signal and Image Processing, University of Luebeck, Germany); Maarten De Vos (University of Oxford, United Kingdom (Great Britain))

**11:30**

## **Computer Aid-System to Identify the First Stage of Prostate Cancer Through Deep-Learning Techniques**

José Gabriel García and Adrián Colomer (Universitat Politècnica de València, Spain); Fernando López-Mir (Universitat Politècnica de València & Instituto Interuniversitario de Investigación en Bioingeniería y Tecnología Orientada al ser Humano, Spain); Jose M. Mossi and Valery Naranjo (Polytechnic University of Valencia, Spain)

**11:50**

## **Reproducibility of Deep CNN for Biomedical Image Processing Across Frameworks and Architectures**

Stefano Olivieri (MathWorks, Italy); Stefano Marrone and Gabriele Piantadosi (University of Naples Federico II, Italy); Carlo Sansone (Università degli Studi di Napoli Federico II, Italy)

**ROOM 4**

## **SiG-DML LII:**

## **Signal processing for big data.**

Chair: Emilie Chouzenoux (Université Paris-Est Marne-la-Vallée, France)

**10:30**

## **Quantifying Uncertainty in High Dimensional Inverse Problems by Convex Optimisation**

Xiaohao Cai (Mullard Space Science Laboratory, University College London, United Kingdom (Great Britain)); Marcelo Pereyra (Heriot-Watt University, United Kingdom (Great Britain)); Jason McEwen (University College London, United Kingdom (Great Britain))



**10:50**

**Deep L1-PCA of Time-Variant Data with Application to Brain Connectivity Measurements**

Giovanna Orrù (Università La Sapienza di Roma, Italy); Tiziana Cattai (Inria Paris, Institut du Cerveau et de la Moelle Épinière, France); Stefania Colonnese and Gaetano Scarano (Università La Sapienza di Roma, Italy); Fabrizio De Vico Fallani (INRIA & Institut du Cerveau et de la Moelle Epiniere, France); Panos P. Markopoulos (Rochester Institute of Technology, USA); Dimitris A. Pados (Florida Atlantic University, USA)

**11:10**

**On Realizing Distributed Deep Neural Networks: An Astrophysics Case Study**

Maria Aspri (Foundation for Research and Technology-Hellas & University of Crete, Greece); Grigorios Tsagkatakis (FORTH, Greece); Athanasia Panousopoulou (Freelance Researcher, United Kingdom (Great Britain)); Panagiotis Tsakalides (FORTH-ICS and University of Crete, Greece)

**11:30**

**How to Apply Random Projections to Nonnegative Matrix Factorization with Missing Entries?**

Farouk Yahaya, Matthieu Puigt, Gilles Delmaire and Gilles Roussel (Université du Littoral Côte d'Opale, France)

**11:50**

**ON-IN: An On-Node and In-Node Based Mechanism for Big Data Collection in Large-Scale Sensor Networks**

Hassan Harb (Antonine University, Lebanon); Marwa Ibrahim (University of Ensta-Bretagne, France); Abbass Nasser (Ensta-Bretagne, France & AUCE, Lebanon); Ali Mansour and Christophe Osswald (ENSTA Bretagne, France)

**AUDITORIUM ARAO**

**TMTSP LIII: Parameter Estimation**

Chair: Daniel P Palomar (Hong Kong University of Science and Technology, Hong Kong)

**10:30**

**On Multivariate non-Gaussian Scale Invariance: Fractional Lévy Processes and Wavelet Estimation**

Benjamin Cooper Boniece and Gustavo Didier (Tulane University, USA); Herwig Wendt (University of Toulouse, CNRS, France); Patrice Abry (Ecole Normale Supérieure, Lyon, France)

**10:50**

**On the Recursions of Robust COMET Algorithm for Convexly Structured Shape Matrix**

Bruno Mériaux (SONDRA, CentraleSupélec, France); Chengfang Ren (CentraleSupélec, France); Arnaud Breloy (University Paris Nanterre, France); Mohammed Nabil El Korso (Paris 10 University & LEME-EA 4416, France); Philippe Forster (Universite Paris Ouest Nanterre, France); Jean-Philippe Ovarlez (ONERA Centrale-Supelec/SONDRA, France)

# Wednesday

11:10

## Semiparametric Stochastic CRB for DOA Estimation in Elliptical Data Model

Stefano Fortunati, Fulvio Gini and Maria S. Greco (University of Pisa, Italy)

11:30

## Random Matrix-Improved Estimation of the Wasserstein Distance Between Two Centered Gaussian Distributions

Malik Tiomoko (Université Paris Saclay/ Gipsa Lab, France); Romain Couillet (Gipsa Lab/Laboratoire des Signaux et Systèmes, Centrale Supélec, France)

11:50

## Parameter Estimation of Heavy-Tailed AR(p) Model from Incomplete Data

Junyan Liu (HKUST, Hong Kong); Sandeep Kumar (Hong Kong University of Science and Technology (HKUST)., India); Daniel P Palomar (Hong Kong University of Science and Technology, Hong Kong)

## POSTER AREA 1

## VIP PIII:

## Signal processing for computer vision

Chair: Athanasios Psaltis (Centre for Research and Technology Hellas, Greece)

A1.1

## Deep Spatio-Temporal Modeling for Object-Level Gaze-Based Relevance Assessment

Konstantinos Stavridis (Centre of Research and Technology Hellas, Greece); Athanasios Psaltis (Centre for Research and Technology Hellas, Greece); Anastasios Dimou (CERTH/ITI, Greece); Georgios Th. Papadopoulos and Petros Daras (Centre for Research and Technology Hellas, Greece)

A1.2

## Dual-threshold Based Local Patch Construction Method for Manifold Approximation and Its Application to Facial Expression Analysis

S L Happy (INRIA Sophia Antipolis, France); Antitza Dantcheva (INRIA, France); Aurobinda Routray (Indian Institute of Technology Kharagpur, India)

A1.3

## Patch-Based Colour Transfer with Optimal Transport

Hana Alghamdi, Mairead Grogan and Rozenn Dahyot (Trinity College Dublin, Ireland)

A1.4

## Super-Resolution on Degraded Low-Resolution Images Using Convolutional Neural Networks

Fatma Albluwi, Vladimir Krylov and Rozenn Dahyot (Trinity College Dublin, Ireland)

A1.5

## Harmonic Networks with Limited Training Samples

Matej Ulicny (Trinity College Dublin & ADAPT Centre, Ireland); Vladimir Krylov and Rozenn Dahyot (Trinity College Dublin, Ireland)

A1.6

## Reversible Privacy Preservation Using Multi-level Encryption and Compressive Sensing

Mehmet Yamac (Tampere University of Technology, Finland); Mete Ahishali, Jenni Raitoharju and Nikolaos Passalis (Tampere University, Finland); Moncef Gabbouj (Tampere University of Technology, Finland); Bulent Sankur (Bogazici University, Turkey)

- A1.7** | **BEV Object Tracking for LIDAR-based Ground Truth Generation**  
David Montero and Nerea Aranjuelo (VICOMTECH, Spain); Orti Senderos and Marcos Nieto (Vicomtech, Spain)
- A1.8** | **Fingerspelled Alphabet Sign Recognition in Upper-Body Videos**  
Katerina Papadimitriou (University of Thessaly); Gerasimos Potamianos (University of Thessaly, Greece)

## POSTER AREA 2

### SPMuS PII: Signal Processing for Sensor Arrays and Networks

Chair: Florian Roemer (Fraunhofer Institute for Nondestructive Testing IZFP & Ilmenau University of Technology, Germany)

- A2.1** | **Reducing the Bias in DRSS-Based Localization: An Instrumental Variable Approach**  
Jun Li, Kutluyıl Doğançay, Ngoc Hung Nguyen and Yee Wei Law (University of South Australia, Australia)
- A2.2** | **Shuffled Bits in the Low-Detectability Regime**  
Stefano Marano (University of Salerno, Italy); Peter Willett (University of Connecticut, USA)
- A2.3** | **On Acoustic Modeling for Broadband Beamforming**  
Amit Chhetri (Amazon Lab126, USA); Mohamed Mansour (Amazon, USA); Wontak Kim and Guangdong Pan (Amazon Lab126, USA)
- A2.4** | **Frequency Diverse Array Beampattern Synthesis with Constrained Nonlinear Programming Frequency Offsets**  
Yan-Shuo Cui, Hui Chen and Wen-Qin Wang (University of Electronic Science and Technology of China, P.R. China)
- A2.5** | **Calibration of Antenna Array with Dual Channel Switched Receiver System**  
Devanand Palur Palanivelu (Fraunhofer Institute for Communication, Information Processing and Ergonomics, Germany); Marc Oispuu (Fraunhofer FKIE, Germany)
- A2.6** | **Blind Calibration of Sensor Arrays for Narrowband Signals with Asymptotically Optimal Weighting**  
Amir Weiss and Arie Yeredor (Tel-Aviv University, Israel)
- A2.7** | **Dual Function FH MIMO Radar System with DPSK Signal Embedding**  
Indu Priya Eedara and Moeness G. Amin (Villanova University, USA)
- A2.8** | **Scheduling Data Embedding in Dual Function Radar Networks**  
Moeness G. Amin (Villanova University, USA); Yunhan Dong (Defence Science and Technology Organisation, Australia); Giuseppe Fabrizio (DSTG, Australia)

## POSTER AREA 3

### SPMuS PIII: Multichannel and Graph Signal Processing

Chair: Elvin Isufi (Delft University of Technology, The Netherlands)

- A3.1** **A Graph Signal Processing Approach to Direction of Arrival Estimation**  
Leandro Moreira (Instituto Militar de Engenharia - IME, Brazil); António Ramos (University College of Southeast Norway, Norway); Marcelo Campos (Universidade Federal do Rio de Janeiro, Brazil); José Antonio Apolinário Jr. (IME, Brazil); Felipe G Serrenho (Instituto Militar de Engenharia, Brazil)
- A3.2** **An NMF-Based Approach for Hyperspectral Unmixing Using a New Multiplicative-tuning Linear Mixing Model to Address Spectral Variability**  
Fatima Zohra Benhalouche and Moussa Sofiane Karoui (Centre des Techniques Spatiales, Algeria); Yannick Deville (University of Toulouse, France)
- A3.3** **An Unmixing-Based Change Detection Approach for Multiresolution Remote Sensing Images**  
Benkouider Yasmine Kheira (Centre des Techniques Spatiales, Arzew, Algeria); Moussa Sofiane Karoui (Centre des Techniques Spatiales, Algeria)
- A3.4** **A Parallel Sparse Regularization Method for Structured Multilinear Low-Rank Tensor Decomposition**  
Gerta Kushe (Technische Universität Darmstadt, Germany); Yang Yang (University of Luxembourg, Luxembourg); Christian Steffens (Technische Universität Darmstadt, Germany); Marius Pesavento (Technische Universität Darmstadt & Merckstr. 25, Germany)
- A3.5** **A Privacy-Preserving Asynchronous Averaging Algorithm Based on Shamir's Secret Sharing**  
Qiongxu Li and Mads Græsbøll Christensen (Aalborg University, Denmark)
- A3.6** **Generalizing Graph Convolutional Neural Networks with Edge-Variant Recursions on Graphs**  
Elvin Isufi (Delft University of Technology, The Netherlands); Fernando Gama and Alejandro Ribeiro (University of Pennsylvania, USA)

**12:10 - 13:10** **Lunch break**

**13:10 - 15:10**

## ROOM 1

### SS5: Machine Audition: recent advances and applications

Organizers: Michele Scarpiniti, Jen-Tzung Chien, Stefano Squartini  
Chairs: Jen-Tzung Chien (National Chiao Tung University, Taiwan), Michele Scarpiniti (Sapienza University of Rome, Italy)

13:10

## **Sounding Industry: Challenges and Datasets for Industrial Sound Analysis**

Sascha Grollmisch, Jakob Abeßer, Judith Liebetrau and Hanna Lukashevich (Fraunhofer IDMT, Germany)

13:30

## **End-to-end Audio Classification with Small Datasets - Making It Work**

Maximilian Schmitt (University of Augsburg, Germany); Björn W Schuller (Imperial College London & University of Augsburg, United Kingdom (Great Britain))

13:50

## **Efficient Phase-Based Acoustic Tracking of Drones Using a Microphone Array**

Paul M Baggenstoss (Fraunhofer FKIE, Germany); Mark Springer (Universität Bonn, Germany); Marc Oispuu and Frank Kurth (Fraunhofer FKIE, Germany)

14:10

## **Providing Spatial Control in Personal Sound Zones Using Graph Signal Processing**

Vicent Molés-Cases and Gema Piñero (Universitat Politècnica de València, Spain); Alberto Gonzalez (Universidad Politecnica de Valencia, Spain); María de Diego (Universitat Politècnica De València, Spain)

14:30

## **CNN-based Virtual Microphone Signal Estimation for MPDR Beamforming in Underdetermined Situations**

Kouei Yamaoka (Tokyo Metropolitan University, Japan); Li Li (University of Tsukuba, Japan); Nobutaka Ono (Tokyo Metropolitan University, Japan); Shoji Makino and Takeshi Yamada (University of Tsukuba, Japan)

14:50

## **Audio-Based Epileptic Seizure Detection**

Md Nahid Istiaq Ahsan (Tampere University, Finland); Csaba Kertesz (University of Tampere & Vincit Oy, Finland); Annamaria Mesaros and Toni Heittola (Tampere University, Finland); Andrew Knight (Neuroeventlabs Oy, Finland); Tuomas Virtanen (Tampere University, Finland)

## **ROOM 2**

## **SPMuS LI: DoA Estimation**

Chair: Dominic K. C. Ho (University of Missouri, USA)

13:10

## **ESPRIT Angles-of-Arrival Estimation with Missing Sensor Data**

Langford White (The University of Adelaide, Australia); Trevor Jackson (Defence Science and Technology Group, Australia)

13:30

## **Maximum-likelihood DOA Estimation at Low SNR in Laplace-like Noise**

Christoph F Mecklenbräuker (Vienna University of Technology, Austria); Peter Gerstoft (University of California, San Diego, USA)

13:50

## **Full Covariance Fitting DoA Estimation Using Partial Relaxation Framework**

David Schenck (Technische Universität Darmstadt, Germany); Minh Trinh Hoang (TU Darmstadt, Germany); Xavier Mestre (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain); Mats Viberg (Chalmers University of Technology, Sweden); Marius Pesavento (Technische Universität Darmstadt & Merckstr. 25, Germany)

# Wednesday

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**14:10**

## **Subspace-Based Method for Direction Estimation of Coherent Signals with Arbitrary Linear Array**

Xiao Chen, Jingmin Xin, Weiliang Zuo and Jie Li (Xi'an Jiaotong University, P.R. China); Nanning Zheng (Xi'an Jiaotong University, P.R. China); Akira Sano (Keio University, Japan)

**14:30**

## **Realtime 2-D DOA Estimation Using Phase-Difference Projection (PDP)**

Hui Chen (King Abdullah University of Science and Technology, Saudi Arabia); Tarig Ballal (King Abdullah University of Science and Technology (KAUST), Saudi Arabia); Xing Liu (King Abdullah University of Science and Technology, Saudi Arabia); Tareq Y. Al-Naffouri (King Abdullah University of Science and Technology, USA)

**14:50**

## **Direct Localization by Partly Calibrated Arrays: A Relaxed Maximum Likelihood Solution**

Amir Adler (MIT, USA); Mati Wax (Technion, Israel)

### **ROOM 3**

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## **BForSec: Passive forensic analysis**

Chair: Giulia Boato (University of Trento, Italy)

**13:10**

## **Automated Forensic Ink Determination in Handwritten Documents by Clustering**

Michael Kalbitz (University of Applied Sciences Brandenburg, Germany); Claus Vielhauer (Brandenburg University of Applied Sciences & Otto-von-Guericke University Magdeburg, Germany)

**13:30**

## **Dempster-Shafer Theory for Fusing Face Morphing Detectors**

Andrey Makrushin, Christian Kraetzer and Jana Dittmann (University of Magdeburg, Germany); Clemens Seibold (Fraunhofer HHI, Germany); Anna Hilsmann (Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut, Germany); Peter Eisert (Fraunhofer HHI & Humboldt University, Germany)

**13:50**

## **Hue Modification Localization by Pair Matching**

Quoc-Tin Phan, Michele Vascotto and Giulia Boato (University of Trento, Italy)

**14:10**

## **DEFACTO: Image and Face Manipulation Dataset**

Gaël Mahfoudi (University of Technology of Troyes, France); Badr Tajini (Eurecom, France); Florent Reiraint (UTT & University of Technology of Troyes, France); Frédéric Morain-Nicolier (Université de Reims Champagne Ardenne, France); Jean Luc Dugelay (Eurecom, France); Marc Pic (SURYS, France)

**14:30**

## **Prediction Residue Analysis in MPEG-2 Double Compressed Video Sequences**

David Vázquez-Padín and Fernando Pérez-González (University of Vigo, Spain)

**14:50**

## Reliable Demosaicing Detection for Image Forensics

Quentin Bammey (École Normale Supérieure Paris-Saclay, France); Rafael Grompone von Gioi and Jean-Michel Morel (Ecole Normale Supérieure de Cachan, France)

**ROOM 4**

## SiG-DML LIII:

## Classification

Chair: Davide Dardari (University of Bologna, Italy)

**13:10**

## Data Augmentation Using Generative Adversarial Network for Environmental Sound Classification

Aswathy Madhu (College of Engineering, Trivandrum, India); Suresh Kumaraswamy (Government Engineering College, Barton Hill, Thiruvananthapuram, India)

**13:30**

## Random Forest on an Embedded Device for Real-time Machine State Classification

Fabian Küppers (Ruhr West University of Applied Sciences, Germany); Jonas Albers (Lenord, Bauer & Co. GmbH, Germany); Anselm Haselhoff (Ruhr West University of Applied Sciences, Germany)

**13:50**

## Self-supervised Attention Model for Weakly Labeled Audio Event Classification

Bongjun Kim (Northwestern University, USA); Shabnam Ghaffarzadegan (Bosch Research and Technology Center, North America, USA)

**14:10**

## Online Multiscale-Data Classification Based on Multikernel Adaptive Filtering with Application to Sentiment Analysis

Ran Iwamoto and Masahiro Yukawa (Keio University, Japan)

**14:30**

## Spectral-Spatial Classification of Hyperspectral Images Using CNNs and Approximate Sparse Multinomial Logistic Regression

Sezer Kutluk (Istanbul University-Cerrahpasa, Turkey); Koray Kayabol (Gebze Technical University, Turkey); Aydin Akan (Izmir Katip Celebi University, Turkey)

**14:50**

## A Complete Framework of Radar Pulse Detection and Modulation Classification for Cognitive EW

Ersin Yar (Bilkent University, Turkey); Mehmet Kocamis (Middle East Technical University, Turkey); Adnan Orduyilmaz and Mahmut Serin (TUBITAK BILGEM ILTAREN, Turkey); Murat Efe (Ankara University, Turkey)

**AUDITORIUM ARAO**

**VIP LIII:**

## Image/Video Filtering

Chair: Fernando Pereira (Instituto Superior Técnico - Instituto de Telecomunicações & Universidade de Lisboa, Portugal)

# Wednesday

13:10

## SOS Boosting for Image Deblurring Algorithms

Shahar Romem Peled (Technion - Israel Institute of Technology, Israel); Yaniv Romano (Stanford University, USA); Michael Elad (Technion, Israel)

13:30

## Statistical Modeling of the Patches DC Component for Low-Frequency Noise Reduction

Antoine Houdard (Université de Bordeaux, France)

13:50

## Iterative Wiener Filtering for Deconvolution with Ringing Artifact Suppression

Filip Šroubek, Tomáš Kerepecký and Jan Kamenický (Institute of Information Theory and Automation, Czech Republic)

14:10

## Single Image Haze Removal Using Conditional Wasserstein Generative Adversarial Networks

Joshua Ebenezer, Bijaylaxmi Das and Sudipta Mukhopadhyay (Indian Institute of Technology Kharagpur, India)

14:30

## Multiple-Degradation Video Super-Resolution with Direct Inversion of the Low-Resolution Formation Model

Santiago Lopez-Tapia (University of Granada, Spain); Alice Lucas (Northwestern University, USA); Rafael Molina (Universidad de Granada, Spain); Aggelos K Katsaggelos (Northwestern University, USA)

14:50

## Hyperspectral X-ray Denoising: Model-Based and Data-Driven Solutions

Nicolò Bonettini, Marco Paracchini, Paolo Bestagini, Marco Marcon and Stefano Tubaro (Politecnico di Milano, Italy)

## POSTER AREA 1

## ASMSP PI: Speech and Voice

Chair: Axel Roebel (IRCAM, France)

A1.1

### ExcitNet Vocoder: A Neural Excitation Model for Parametric Speech Synthesis Systems

Eunwoo Song (Naver Corp., Korea); Kyungguen Byun and Hong-Goo Kang (Yonsei University, Korea)

A1.2

### Concatenated Identical DNN (CI-DNN) to Reduce Noise-Type Dependence in DNN-Based Speech Enhancement

Ziyi Xu and Maximilian Strake (Institute for Communications Technology, Technische Universität Braunschweig, Germany); Tim Fingscheidt (Technische Universität Braunschweig, Germany)

A1.3

### WGANSing: A Multi-Voice Singing Voice Synthesizer Based on the Wasserstein-GAN

Pritish Chandna, Merlijn Blaauw, Jordi Bonada and Emilia Gomez (Universitat Pompeu Fabra, Spain)



- A1.4** | **Refined WaveNet Vocoder for Variational Autoencoder Based Voice Conversion**  
 Wen-Chin Huang (Nagoya University & Academia Sinica, Japan); Yi-Chiao Wu (Nagoya University, Japan); Hsin-Te Hwang (Academia Sinica, Taiwan); Patrick Tobing, Tomoki Hayashi, Kazuhiro Kobayashi and Tomoki Toda (Nagoya University, Japan); Yu Tsao (Research Center for Information Technology Innovation, Academia Sinica, Taiwan); Hsin-Min Wang (Academia Sinica, Taiwan)
- A1.5** | **TV-CAR Speech Analysis Based on Regularized LP**  
 Keiichi Funaki (University of the RYUKYUS, Japan)
- A1.6** | **A Speech Reconstruction Algorithm via Iteratively Reweighted  $\ell_2$  Minimization for MFCC Codec**  
 Gang Min (Institute of Information and Communication, National University of Defense Technology, P.R. China)
- A1.7** | **Effectiveness of Cross-Domain Architectures for Whisper-to-Normal Speech Conversion**  
 Mihir Parmar and Savan Doshi (DA-IICT, Gandhinagar, India); Nirmesh Shah (DA-IICT Gandhinagar, India); Maitreya Patel (DA-IICT, Gandhinagar, India); Hemant A. Patil (Dhirubhai Ambani Institute of Information and Communication Technology, India)
- A1.8** | **Front-End Feature Compensation for Noise Robust Speech Emotion Recognition**  
 Meghna Abhishek Pandharipande (Tata Consultancy Services, India); Rupayan Chakraborty (TCS Research and Innovation, India); Ashish Panda (Tata Consultancy Services, India); Biswajit Das (Innovation Labs, Tata Consultancy Services, India); Sunil Kumar Kopparapu (Tata Consultancy Services, India)
- A1.9** | **Speech-Based Stress Classification Based on Modulation Spectral Features and Convolutional Neural Networks**  
 Anderson Avila (INRS-EMT, Canada); Shruti Kshirsagar (INRS, Canada); Abhishek Tiwari (INRS-EMT, Canada); Daniel Lafond (Thales Canada, Canada); Douglas O'Shaughnessy (INRS-Énergie-Matériaux-Télécommunications, Canada); Tiago Falk (INRS-EMT, Canada)
- A1.10** | **Analysing Deep Learning-Spectral Envelope Prediction Methods for Singing Synthesis**  
 Frederik N. A. Bous and Axel Roebel (IRCAM, France)
- A1.11** | **Investigation of Reverse Mode Loudspeaker Performance in Urban Sound Classification**  
 Gyorgy Kalmar (University of Szeged, Hungary)

## POSTER AREA 2

### ASMSP PII: Reverberation Reduction and Signal Enhancement

Chair: Mads Græsbøll Christensen (Aalborg University, Denmark)

- A2.1** **Performance Analysis of Diffusion Filtered-X Algorithms in Multitask ANC Systems**  
Yijing Chu (The University of Hong Kong, Hong Kong)
- A2.2** **Estimating & Mitigating the Impact of Acoustic Environments on Machine-to-Machine Signalling**  
Amogh K Matt (Machine Listening Lab, Centre for Digital Music, Queen Mary University of London, Spain); Dan Stowell (Queen Mary - University of London, United Kingdom (Great Britain))
- A2.3** **Clean Speech AE-DNN PSD Constraint for MCLP Based Reverberant Speech Enhancement**  
Srikanth Raj Chetupalli (Indian Institute of Science, India); Thippur Sreenivas (IISc, India)
- A2.4** **Laplace Nonnegative Matrix Factorization with Application to Semi-supervised Audio Denoising**  
Hiroki Tanji, Takahiro Murakami and Hiroyuki Kamata (Meiji University, Japan)  
Introducing SPAIN (SParse Audio INpainter)  
Ondřej Mokřý, Pavel Závíška, Pavel Rajmic and Vítězslav Veselý (Brno University of Technology, Czech Republic)
- A2.5** **A New Weighted NMF Algorithm for Missing Data Interpolation and Its Application to Speech Enhancement**  
Sushmita Thakallapalli (International Institute of Information Technology, Hyderabad, India); Suryakanth Gangashetty (IIIT Hyderabad, India); Nilesh Madhu (Universiteit Gent - imec, Belgium)
- A2.6** **Adaptive Pre-whitening Based on Parametric NMF**  
Alfredo Esquivel Jaramillo, Jesper Kjær Nielsen and Mads Græsbøll Christensen (Aalborg University, Denmark)
- A2.7** **A Comparison of Machine Learning Methods for Detecting Right Whales from Autonomous Surface Vehicles**  
Will Vickers and Ben Milner (University of East Anglia, United Kingdom (Great Britain)); Robert Lee (Gardline Geosurvey Limited, United Kingdom (Great Britain)); Jason Lines (University of East Anglia, United Kingdom (Great Britain))

## POSTER AREA 3

### SS6: **Evaluation of Vehicular Wireless Communications and their Applications based on Experimental Data**

Organizers: Martin Klaus Müller, José A. García-Naya, José Rodríguez-Piñero  
Chairs: Martin Klaus Müller (TU Wien, Austria), José Rodríguez-Piñero (Tongji University, P.R. China)

- A3.1** **Integration of High Speed Train Channel Measurements in System Level Simulations**  
Martin Klaus Müller (TU Wien, Austria); Tomás Domínguez-Bolaño, José A. García-Naya and Luis Castedo (University of A Coruña, Spain); Markus Rupp (TU Wien, Austria)
- A3.2** **Feasibility of LTE for Train Control in Subway Environments Based on Experimental Data**  
Ángel Carro-Lagoa and Tomás Domínguez-Bolaño (University of A Coruña, Spain); José Rodríguez-Piñeiro (Tongji University, P.R. China); Miguel González-López (Universidade da Coruña, Spain); José A. García-Naya (University of A Coruña, Spain)
- A3.3** **LTE-based Wireless Channel Modeling on High-Speed Railway at 465MHz**  
Yanfei Niu, Jian-wen Ding, Dan Fei and Zhangdui Zhong (Beijing Jiaotong University, P.R. China); Yanbing Liu (Jiaxun Feihong Intelligent Technology Institute, P.R. China)
- A3.4** **Measurement-based Wideband Radio Channel Characterization in an Underground Parking Lot**  
Yang Miao (Southern University of Science and Technology, P.R. China); Wei Wang (Chang'an University, P.R. China); José Rodríguez-Piñeiro (Tongji University, P.R. China); Tomás Domínguez-Bolaño (University of A Coruña, Spain); Yi Gong (Southern University of Science and Technology, Shenzhen, P.R. China)
- A3.5** **Experimental Evaluation of the Reconfigurable Photodetector for Blind Interference Alignment in Visible Light Communications**  
Máximo Morales-Céspedes, Ahmad Adnan Quidan and Ana Garcia Armada (Universidad Carlos III de Madrid, Spain)
- A3.6** **Path Loss at 5 GHz and 31 GHz for Two Distinct Indoor Airport Settings**  
David W Matolak and Mohanad Mohsen (University of South Carolina, USA); Jinming Chen (UESTC, P.R. China)
- A3..7** **Optimization of the Radio Access to Provide Vehicular Communications Based on Drive Tests**  
Alberto Alvarez Polegre (Universidad Carlos III de Madrid, Spain); Raquel Perez Leal (Universidad Carlos III de Madrid, Spain); Jose Antonio Garcia Garcia (Nokia Spain, Spain); Ana Garcia Armada (Universidad Carlos III de Madrid, Spain)
- A3.8** **Decentralized Multi-Agent Deep Reinforcement Learning in Swarms of Drones for Flood Monitoring**  
David Baldazo (Universidad Politecnica de Madrid, Spain); Juan Parras (Universidad Politécnica de Madrid, Spain); Santiago Zazo (Universidad Politecnica Madrid, Spain)

**15:10 - 15:40** **Coffee break**

## 15:40 - 17:20

### ROOM 1

#### SS9: Tensor-Based Signal Processing I

Organizers: Lieven De Lathauwer, Sabine Van Huffel

Chair: Sabine Van Huffel (Katholieke Universiteit Leuven, Belgium)

15:40

#### Tensor Network Kalman Filter for LTI Systems

Daniel Gedon, Pieter Piscaer, Kim Batselier and Carlas Smith (TU Delft, The Netherlands); Michel Verhaegen (Delft University of Technology, Belgium)

16:00

#### Rank-one Tensor Approximation with Beta-divergence Cost Functions

Michiel Vandecappelle and Nico Vervliet (KU Leuven, Belgium); Lieven De Lathauwer (KU Leuven Kulak, Belgium)

16:20

#### Joint Low-Rank Factorizations with Shared and Unshared Components Identifiability and Algorithms

Mikael Sorensen and Nikolaos D Sidiropoulos (University of Virginia, USA)

16:40

#### Two-Way MIMO Decode-and-Forward Relaying Systems with Tensor Space-Time Coding

Walter Freitas, Jr. (Federal University of Ceará & Wireless Telecom Research Group, Brazil); Gérard Favier (I3S, CNRS, University of Nice Sophia-Antipolis, France); André de Almeida (Federal University of Ceará & Wireless Telecom Research Group - GTEL, Brazil); Martin Haardt (Ilmenau University of Technology, Germany)

17:00

#### Large-scale Canonical Polyadic Decomposition via Regular Tensor Sampling

Charilaos I. Kanatsoulis (University of Minnesota, USA); Nikolaos D Sidiropoulos (University of Virginia, USA)

### ROOM 2

#### ASMSP LIV:

#### Noise and Echo Reduction

Chair: Alberto Gonzalez (Universidad Politecnica de Valencia, Spain)

15:40

#### Offline Noise Reduction Using Optimal Mass Transport Induced Covariance Interpolation

Filip Elvander (Lund University, Sweden); Randall Ali (KU Leuven, Belgium); Andreas Jakobsson (Lund University, Sweden); Toon van Waterschoot (KU Leuven, Belgium)

16:00

#### Infinite Impulse Response Echo Canceller in STFT Domain for Reverberant Environments

Shmulik Markovich-Golan (Intel Corporation & Bar-Ilan University, Israel); Amos Schreibman (Intel Corporation, Israel)

**16:20**

## **Change Prediction for Low Complexity Combined Beamforming and Acoustic Echo Cancellation**

Matthias Schrammen (RWTH Aachen University, Germany); Alexander Bohlender (Ghent University - imec, Belgium); Stefan Kühl and Peter Jax (RWTH Aachen University, Germany)

**16:40**

## **An EM Algorithm for Joint Dual-Speaker Separation and Dereverberation**

Nili Cohen, Gershon Hazan, Boaz Schwartz and Sharon Gannot (Bar-Ilan University, Israel)

**17:00**

## **Maximum Likelihood Convolutional Beamformer for Simultaneous Denoising and Dereverberation**

Tomohiro Nakatani and Keisuke Kinoshita (NTT Corporation, Japan)

### **ROOM 3**

## **SPMuS LII: Sampling and Filtering over Graphs**

Chair: Cédric Richard

(Université de Nice Sophia-Antipolis, France)

**15:40**

## **An Adaptive Sampling Technique for Graph Diffusion LMS Algorithm**

Daniel Tiglea (University of São Paulo, Brazil); Renato Candido (University of Sao Paulo, Brazil); Magno T. M. Silva (University of São Paulo, Brazil)

**16:00**

## **Subsampling of Multivariate Time-Vertex Graph Signals**

Pierre Humbert (CMLA, France); Laurent Oudre (Université Paris 13, France); Nicolas Vayatis (CMLA, ENS Cachan, CNRS, Université Paris-Saclay & COGNAC G, University Paris Descartes, CNRS, France)

**16:20**

## **Graph Filter Design Using Sum-of-squares Representation**

Tuomas Aittomäki (Aalto University, Finland); Geert Leus (Delft University of Technology, The Netherlands)

**16:40**

## **Distributed Consensus-Based Extended Kalman Filtering: A Bayesian Perspective**

Shengdi Wang and Armin Dekorsy (University of Bremen, Germany)

**17:00**

## **Defining Graph Signal Distances Using an Optimal Mass Transport Framework**

Maria Juhlin, Filip Elvander and Andreas Jakobsson (Lund University, Sweden)

### **ROOM 4**

## **SPCN LIII: Multi-user Communication Systems**

Chair: Ignacio Santamaria (University of Cantabria, Spain)

**15:40**

## **Wireless Multi-group Multicast Precoding with Selective RF Energy Harvesting**

Sumit Gautam, Eva Lagunas and Symeon Chatzinotas (University of Luxembourg, Luxembourg); Björn Ottersten (University of Luxembourg, Luxembourg)

## Wednesday

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**16:00**

### **Multi-point Connectivity for Reliable mmWave**

Dileep Kumar, Jarkko Kaleva and Antti Tölli (University of Oulu, Finland)

**16:20**

### **Globally Optimal TIN Strategies with Time-Sharing in the MISO Interference Channel**

Christoph Hellings (Technische Universität München, Germany); Bho Matthiesen (Technische Universität Dresden, Germany); Eduard Jorswieck (Technische Universität Braunschweig, Germany); Wolfgang Utschick (Technische Universität München, Germany)

**16:40**

### **Rate Balancing for Multiuser Multicell Downlink MIMO Systems**

Imène Ghamnia (Eurecom & Orange, France); Dirk Slock (EURECOM, France); Yi Yuan-Wu (Orange Labs, France)

**17:00**

### **Energy-Efficient Improper Signaling for $\mathbb{K}\mathbb{S}$ -User Interference Channels**

Mohammad Soleymani (Universität Paderborn, Germany); Christian Lameiro (University of Paderborn, Germany); Ignacio Santamaria (University of Cantabria, Spain); Peter J. Schreier (Universitaet Paderborn, Germany)

## **AUDITORIUM ARAO**

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## **TMTSP LIV: Signal Modeling and Estimation**

Chair: Stefano Marano  
(University of Salerno, Italy)

**15:40**

### **Algorithms for Piecewise Constant Signal Approximations**

Leif Bergerhoff and Joachim Weickert (Saarland University, Germany); Yehuda Dar (Technion, Israel)

**16:00**

### **Regression to a Linear Lower Bound with Outliers: An Exponentially Modified Gaussian Noise Model**

Julien Gori (LRI, Université Paris-Sud, CNRS, France); Olivier Rioul (Telecom ParisTech & Ecole Polytechnique, France)

**16:20**

### **Modelling Mismatch and Noise Statistics Uncertainty in Linear MMSE Estimation**

Jordi Vilà-Valls (ISAE-SUPAERO, University of Toulouse, France); Eric Chaumette and François Vincent (ISAE, France); Pau Closas (Northeastern University, USA)

**16:40**

### **Identification of Vector Autoregressive Models with Granger and Stability Constraints**

Bogdan Dumitrescu (University Politehnica of Bucharest, Romania); Ciprian Doru Giurcaneanu and Yixia Ding (The University of Auckland, New Zealand)

**17:00**

### **A Modelling Approach to Generate Representative UAV Trajectories Using PSO**

Babak Salamat (Universitätsstr. 68 & Alpen-Adria Universität, Austria); Andrea M Tonello (University of Klagenfurt, Austria)

## POSTER AREA 1

### SiG-DML PII:

### Learning theory

Chair: Víctor Elvira (IMT Lille Douai, France)

- A1.1** **Training Variational Autoencoders with Discrete Latent Variables Using Importance Sampling**  
Alexander Bartler, Felix Wiewel, Lukas Mauch and Bin Yang  
University of Stuttgart, Germany)
- A1.2** **Partially Adversarial Learning and Adaptation**  
Jen-Tzung Chien and Yu-Ying Lyu (National Chiao Tung University, Taiwan)
- A1.3** **Reparameterization Gradient Message Passing**  
Semih Akbayrak and Bert de Vries (Eindhoven University of Technology, The Netherlands)
- A1.4** **Variational Bayesian GAN**  
Jen-Tzung Chien and Chun-Lin Kuo (National Chiao Tung University, Taiwan)
- A1.5** **Convolutional LSTM-based Long-Term Spectrum Prediction for Dynamic Spectrum Access**  
Bethelhem Seifu Shawel (Addis Ababa Institute of Technology, Ethiopia); Dereje H. Woldegebreal (Addis Ababa University, Addis Ababa Institute of Technology, Ethiopia); Sofie Pollin (KU Leuven, Belgium)
- A1.6** **Training Generative Adversarial Networks with Weights**  
Yannis Pantazis (Foundation for Research and Technology - Hellas & Institute of Applied and Computational Mathematics, Greece); Dipjyoti Paul (University of Crete, Greece); Michail Fasoulakis (ICS-FORTH, Greece); Yannis Stylianou (University of Crete, Greece)
- A1.7** **Finding Common Image Semantics for Urban Perceived Safety Based on Pairwise Comparisons**  
Gabriel Costa and Claudia Soares (Instituto Superior Técnico, Portugal); Manuel Marques (Instituto de Sistemas e Robotica, Portugal)
- A1.8** **Compressive Independent Component Analysis**  
Michael P Sheehan, Madeleine S Kotzagiannidis and Mike E Davies (University of Edinburgh, United Kingdom (Great Britain))

## POSTER AREA 2

### DIS PI: DSP

### Implementation and Optimisation

Chair: Alberto Carini (Università di Trieste, Italy)

- A2.1** **Memory-Optimized Voronoi Cell-Based Parallel Kernels for the Shortest Vector Problem on Lattices**  
Filipe Cabeleira (Instituto de Telecomunicações, Portugal); Artur Mariano (University of Minho, Portugal); Gabriel Falcao (Instituto de Telecomunicações, University of Coimbra, Portugal)
- A2.2** **Sensor Fusion for Learning-based Tracking of Controller Movement in Virtual Reality**  
Chen Song (The State University of New York at Buffalo, USA); Shuayb Zarar (Microsoft Research, USA)

- A2.3** **Bayesian Time-Domain Multiple Sound Source Localization for a Stochastic Machine**  
Raphael Frisch (University of Grenoble Alpes, France); Marvin Faix (University of Grenoble Alpes, LIG, France); Jacques Droulez (ISIR: CNRS/Sorbonne University, Paris, France); Laurent Girin (GIPSA-Lab, Grenoble-INP, France); Emmanuel Mazer (CNRS, LIG, Grenoble, France)
- A2.4** **2-D Non-Separable Integer Implementation of Paraunitary Filter Bank Based on the Quaternionic Multiplier Block-Lifting Structure**  
Eugene Rybenkov (Belarusian State University of Informatics and Radioelectronics, Belarus); Nick A Petrovsky (Belarusian State University of Informatics and Radioelectronics & BSUIR, Belarus)
- A2.5** **Hardware Acceleration of Approximate Transform Module for the Versatile Video Coding**  
Ahmed Kammoun (Univ Rennes, INSA Rennes, France); Wassim Hamidouche (IETR-INSA Rennes, France); Pierrick Philippe (IRT bcom, France); Fatma Belghith (Sfax University & National Engineering School of Sfax, Tunisia); Nouri Massmoudi (University of Sfax, Tunisia); Jean Francois Nezan (INSA, Rennes, France, France)
- A2.6** **Optimization of Signal Processing Chains: Application to Cascaded Filters**  
Arthur Hugeot (Université de Bourgogne Franche-Comté, France); Julien Bernard (Université de Franche-Comté, France); Jean-Michel Friedt (Senseor, France); Pierre-Yves Bourgeois and Gwenhaël Goavec-Merou (Université de Bourgogne Franche-Comté, France)
- A2.7** **Heart Disease Detection Architecture for Lead I Off-the-Person ECG Monitoring Devices**  
Pedro Sá (INESC-ID, Instituto Superior Técnico, Universidade de Lisboa, Portugal); Helena Aidos (LASIGE, Faculdade de Ciências, Universidade de Lisboa & Instituto de Telecomunicações, Instituto Superior Técnico, Portugal); Nuno Roma (INESC-ID, IST, University of Lisbon, Portugal); Pedro Tomás (Instituto Superior Técnico & INESC-ID, Portugal)
- A2.8** **FPGA Implementation of a TVWS Up- And Downconverter Using Non-Power-of-Two FFT Modulated Filter Banks**  
Vianney Anis, Jincheng Guo, Stephan Weiss and Louise Crockett (University of Strathclyde, United Kingdom (Great Britain))

## POSTER AREA 3

### SS1:

### Advanced Signal Processing for Resource-Efficient 5G Satellite-Terrestrial Networks

Organizers: Eva Lagunas, Charly Poulliat, Paul de Kerret  
Chair: Eva Lagunas (University of Luxembourg, Luxembourg)



- A3.1** **Power-Efficient Secure Beamforming in Cognitive Satellite-Terrestrial Networks**  
Weixin Lu (Army Engineering University, P.R. China); Kang An (National University of Defense Technology, P.R. China); Xiaojuan Yan (Guilin University of Electronic Technology, P.R. China); Tao Liang (Nanjing Telecommunication Technology Institute, P.R. China)
- A3.2** **Validation Framework for Building a Spectrum Sharing Testbed for Integrated Satellite-Terrestrial Systems**  
Marko Höyhtyä (VTT Technical Research Centre of Finland Ltd, Finland); Mika Hoppari (VTT, Finland); Mikko Majanen (VTT Technical Research Centre of Finland, Finland)
- A3.3** **Resource Optimization for Cognitive Satellite Systems with Incumbent Terrestrial Receivers**  
Arthur Louchart and Philippe Ciblat (Telecom ParisTech & Institut Polytechnique de Paris, France); Paul de Kerret (EURECOM, France)
- A3.4** **Satellite Links Integrated in 5G SDN-enabled Backhaul Networks: An Iterative Joint Power and Flow Assignment**  
Eva Lagunas, Lei Lei and Symeon Chatzinotas (University of Luxembourg, Luxembourg); Björn Ottersten (University of Luxembourg, Luxembourg)
- A3.5** **Neural Network Aided Computation of Generalized Spatial Modulation Capacity**  
Anxo Tato (AtlanTTic Research Center, University of Vigo, Spain); Carlos Mosquera (University of Vigo, Spain); Pol Henarejos (Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Spain); Ana Pérez-Neira (CTTC, Spain)
- A3.6** **On the Physical Layer Security of IoT Devices over Satellite**  
Joan Bas (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain); Ana Isabel Pérez-Neira (Universitat Politècnica de Catalunya, Spain)
- A3.7** **Spectral Coexistence of 5G Networks and Satellite Communication Systems Enabled by Coordinated Caching and QoS-Aware Resource Allocation**  
Konstantinos Ntougias and Constantinos B. Papadias (Athens Information Technology, Greece); Georgios K. Papageorgiou (Heriot-Watt University, United Kingdom (Great Britain)); Gerhard Hasslinger (Deutsche Telekom, Germany)

**19:30 - 23:30** **Conference Banquet**

**THURSDAY, SEPTEMBER 5<sup>TH</sup>**

**9:30 - 10:30** **PLENARY SPEAKERS**

## AUDITORIUM ARAO

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### PLEN-3: "Academic research, Standardization and Open-Prototyping"

Raymond Knopp

(EURECOM, Sophia Antipolis, France)

Chair: Markus Rupp (TU Wien, Austria)

**10:30 - 11:00 Coffee break**

**11:00 - 12:40**

## ROOM 1

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### SS9: Tensor-Based Signal Processing II

Organizers: Lieven De Lathauwer, Sabine Van Huffel

Chair: Lieven De Lathauwer (KU Leuven Kulak, Belgium)

**11:00**

#### NLS Algorithm for Kronecker-Structured Linear Systems with a CPD Constrained Solution

Martijn Bousse (KU Leuven, Belgium); Nikolaos D Sidiropoulos (University of Virginia, USA); Lieven De Lathauwer (KU Leuven Kulak, Belgium)

**11:20**

#### Estimation of Sensor Array Signal Model Parameters Using Factor Analysis

Andreas I Koutrouvelis, Richard Hendriks and Richard Heusdens (Delft University of Technology, The Netherlands); Jesper Jensen (Oticon, Denmark)

**11:40**

#### Estimation of a Low-Rank Probability-Tensor from Sample Sub-Tensors via Joint Factorization Minimizing the Kullback-Leibler Divergence

Arie Yeredor (Tel-Aviv University, Israel); Martin Haardt (Ilmenau University of Technology, Germany)

**12:00**

#### Tensor Factorisation and Transfer Learning for Sleep Pose Detection

Sara Mahvash Mohammadi (University of Surrey, United Kingdom (Great Britain)); Samaneh Kouchaki (University of Oxford, United Kingdom (Great Britain)); Saeid Sanei (Nottingham Trent University & Imperial College London, United Kingdom (Great Britain)); Derk-Jan Dijk, Adrian Hilton and Kevin Wells (University of Surrey, United Kingdom (Great Britain))

**12:20**

#### New Algorithms on Complex Joint Eigenvalue Decomposition Based on Generalized Givens Rotations

Mesloub Ammar (Ecole Militaire Polytechnique, Algeria); Adel Belouchrani (Ecole Nationale Polytechnique, Algiers, Algeria); Karim Abed-Meraim (Polytech'Orléans & University of Sharjah, UAE, France)

## ROOM 2

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### SPMuS LIII: Radar and Sonar Detection

Chair: Fulvio Gini (University of Pisa, Italy)

**11:00**

**Sampling Rate and Bits per Sample Tradeoff for Cloud MIMO Radar Target Detection**

Zhen Wang and Qian He (University of Electronic Science and Technology of China, P.R. China); Rick Blum (Lehigh University, USA)

**11:20**

**Forward Looking GPR-Based Landmine Detection Using a Robust Likelihood Ratio Test**

Afief Dias Pambudi (Signal Processing Group, Technische Universität Darmstadt, Germany); Michael Fauß (Technische Universität Darmstadt, Germany); Fauzia Ahmad (Temple University, USA); Abdelhak M Zoubir (Darmstadt University of Technology, Germany)

**11:40**

**Generalized Gamma Distribution SAR Sea Clutter Modelling for Oil Spill Candidates Detection**

Mari-Cortes Benito-Ortiz, David Mata-Moya and Maria -Pilar Jarabo-Amores (University of Alcalá, Spain); Nerea del Rey-Maestre and Pedro-Jose Gomez-del-Hoyo (University of Alcala, Spain)

**12:00**

**Detection Enumeration and Localization of Underwater Acoustic Sources**

P. Nagesh (PES University, India); Gargeshwari V. Anand (PES University, Bangalore, India); N. Kalyanasundaram and Sanjeev Gurugopinath (PES University, India)

**12:20**

**Improved Waveforms for Time-Efficient Radar Range Measurement Disambiguation**

Alexander M Daniel (Defense Research and Development Canada, Canada)

**ROOM 3**

**BISA LIV: Biomedical Image Processing**

Chair: Francoise Peyrin (Universite de Lyon  
INSA Lyon & Inserm U1206 UMR CNRS 5220, France)

**11:00**

**A Sparse and Prior Based Method for 3D Image Denoising**

Juan F Perez Juste Abascal and Si-mohamed Salim (CNRS, France); Philippe Douek (Creatis Universite de Lyon INSA Lyon, France); Christine Chappard (B20A, France); Francoise Peyrin (Universite de Lyon INSA Lyon & Inserm U1206 UMR CNRS 5220, France)

**11:20**

**Image and Ontological Information Fusion for Cataract Surgery Recommendation**

José N Galveia (Centro Cirúrgico de Coimbra, Portugal); Luís A. da Silva Cruz (Instituto de Telecomunicacoes / University of Coimbra, Portugal); António Travassos (Centro Cirúrgico de Coimbra, Portugal)

**11:40**

**Cardiac Motion Estimation Using Convolutional Sparse Coding**

Nelson Diaz (Universidad Industrial de Santander, Colombia); Adrian Basarab (University of Toulouse, France); Jean-Yves Tournet (University of Toulouse & ENSEEIHT, France); Henry Arguello Fuentes (Universidad Industrial de Santander, Colombia)

# Thursday

12:00

## Unsupervised Medical Image Translation Using Cycle-MedGAN

Karim Armanious (Institute of Signal Processing and System Theory, Germany); Chenming Jiang, Sherif Abdulatif and Thomas Küstner (University of Stuttgart, Germany); Sergios Gatidis (University of Tübingen, Germany); Bin Yang (University of Stuttgart, Germany)

12:20

## Prediction of FDG Uptake in Lung Tumors from CT Images Using Generative Adversarial Networks

Annika Liebgott (University Hospital of Tuebingen & University of Stuttgart, Germany); Darius Hinderer (University of Stuttgart, Germany); Karim Armanious (Institute of Signal Processing and System Theory, Germany); Alexander Bartler (University of Stuttgart, Germany); Konstantin Nikolaou (University Hospital of Tuebingen, Germany); Sergios Gatidis (University of Tübingen, Germany); Bin Yang (University of Stuttgart, Germany)

## ROOM 4

### SiG-DML LIV:

### Neural Networks

Chair: Saikat Chatterjee (KTH - Royal Institute of Technology & Communication Theory Lab, Sweden)

11:00

## Ship Classification from Multi-Spectral Satellite Imaging by Convolutional Neural Networks

Raffaele Grasso (CMRE, Italy)

11:20

## Segmentation of Surface Cracks Based on a Fully Convolutional Neural Network and Gated Scale Pooling

Jacob König (Glasgow Caledonian University & Geckotech Solutions Ltd., United Kingdom (Great Britain)); Mark David Jenkins and Peter Barrie (Glasgow Caledonian University, United Kingdom (Great Britain)); Mike Mannion (Glasgow Caledonian University, United Kingdom (Great Britain)); Gordon Morison (Glasgow Caledonian University, United Kingdom (Great Britain))

11:40

## Gearbox Fault Diagnosis Using Convolutional Neural Networks and Support Vector Machines

Zhuyun Chen (South China University of Technology, P.R. China); Chenyu Liu (KU Leuven & DMMS Group, Flanders Make, Belgium); Weihua Li (South China University of Technology, P.R. China); Konstantinos Gryllias (KU Leuven & DMMS Group, Flanders Make, Belgium)

12:00

## Curriculum-based Teacher Ensemble for Robust Neural Network Distillation

Georgios Panagiotatos (Aristotle University of Thessaloniki, Greece); Nikolaos Passalis (Tampere University, Finland); Alexandros Iosifidis (Aarhus University, Denmark); Moncef Gabbouj (Tampere University of Technology, Finland); Anastasios Tefas (Aristotle University of Thessaloniki, Greece)

**12:20**

**End-to-End Language Identification Using a Residual Convolutional Neural Network with Attentive Temporal Pooling**

João Monteiro (INRS-EMT, Canada); Md. Jahangir Alam (Computer Research Institute of Montreal (CRIM) & Institut National de la Recherche Scientifique (INRS), Canada); Gautam Bhattacharya (McGill University, Canada); Tiago Falk (INRS-EMT, Canada)

**AUDITORIUM ARAO**

**VIP LIV: Video Segmentation and Feature Extraction**

Chair: João Ascenso (Instituto Superior Técnico & Instituto de Telecomunicações, Portugal)

**11:00**

**On Detecting and Handling Target Occlusions in Correlation-filter-based 2D Tracking**

Iason Karakostas, Vasileios Mygdalis, Anastasios Tefas and Ioannis Pitas (Aristotle University of Thessaloniki, Greece)

**11:20**

**Efficient Feature Extraction for Person Re-Identification via Distillation**

Francisco Duarte de Sousa Salgado and Rakesh Mehta (United Technologies Research Center, Ireland); Paulo Lobato Correia (Instituto Superior Tecnico - Universidade Tecnica Lisboa & Instituto de Telecomunicacoes, Portugal)

**11:40**

**Cross-domain Knowledge Transfer Schemes for 3D Human Action Recognition**

Athanasios Psaltis, Georgios Th. Papadopoulos and Petros Daras (Centre for Research and Technology Hellas, Greece)

**12:00**

**Complexity Scalable HEVC-to-AV1 Transcoding Based on Coding Tree Depth Inheritance**

Alex Borges (Federal University of Pelotas (UFPe), Brazil); Bruno Zatt, Marcelo Porto, Luciano Agostini and Guilherme Correa (Federal University of Pelotas, Brazil)

**12:20**

**NAViDAd: A No-Reference Audio-Visual Quality Metric Based on a Deep Autoencoder**

Helard Martinez and Mylene Farias (University of Brasilia, Brazil); Andrew Hines (University College Dublin, Ireland)

**POSTER AREA 1**

**TMTSP PIII: Signal processing theory and methods**

Chair: Stefano Fortunati (University of Pisa, Italy)

**A1.1**

**Asymptotic Karlin-Rubin's Theorem with Application to Signal Detection in a Subspace Cone**

Sabrina Bourmani (IMT Atlantique, France); Francois-Xavier Socheleau (Telecom Bretagne, France); Dominique Pastor (IMT Atlantique, France)

- A1.2** **Scale-discretised Ridgelet Transform on the Sphere**  
Matthew Alexander Price (University College London & Mullard Space Science Laboratory, United Kingdom (Great Britain)); Jason McEwen (University College London, United Kingdom (Great Britain))
- A1.3** **Two-Band Signal Reconstruction from Periodic Nonuniform Samples**  
Li Ping Guo (City University of Hong Kong, Hong Kong); Chi-Wah Kok (Canaan Semiconductor Limited, Hong Kong); Hing Cheung So (City University of Hong Kong, Hong Kong); Wing-Shan Tam (Canaan Semiconductor Limited, Hong Kong)
- A1.4** **Separation of Independent / Dependent Sources Using Copulas**  
Nezha Mamouni (LMR, URCA & LAMAI, UCA, France)
- A1.5** **Demodulation Algorithm Based on Higher Order Synchrosqueezing**  
Duong-Hung Pham (Labo Icube, France); Sylvain Meignen (University of Grenoble, France)
- A1.6** **A New Signal-Selective Wide-Band Ambiguity Function**  
Antonio Napolitano (Universita di Napoli Parthenope, Italy)
- A1.7** **Joint Unmixing-Deconvolution Algorithms for Hyperspectral Images**  
Yingying Song (University of Lorraine, France); El-Hadi Djermoune (CRAN, Université de Lorraine, CNRS, France); David Brie (CRAN, Nancy Université, CNRS, France); Cédric Richard (Université de Nice Sophia-Antipolis, France)
- A1.8** **A Blind Reconstruction Algorithm for Level-Crossing Analog-to-Digital Conversion**  
Antoine Souloumiac (CEA, LIST, Data Science and Decision Laboratory, France)
- A1.9** **Segmentation of Piecewise ARX Processes by Exploiting Sparsity in Tight-Dimensional Spaces**  
Hiroki Kuroda (Tokyo Institute of Technology); Masao Yamagishi and Isao Yamada (Tokyo Institute of Technology, Japan)
- A1.10** **Signal Recovery from Phaseless Measurements of Spherical Harmonics Expansion**  
Arya Bangun, Arash Behboodi and Rudolf Mathar (RWTH Aachen University, Germany)
- A1.11** **Connections Between Reassigned Spectrum and Least Squares Estimation for Sinusoidal Models**  
Yannis Pantazis (Foundation for Research and Technology - Hellas & Institute of Applied and Computational Mathematics, Greece); Vassilis Tsiaras (Technical University of Crete, Greece); Yannis Stylianou (University of Crete, Greece)

- A2.1** **Defect Detection from Compressed 3-D Ultrasonic Frequency Measurements**  
 Sebastian Semper (TU Ilmenau, Germany); Jan Kirchhof (Fraunhofer Institute for Nondestructive Testing IZFP & TU Ilmenau, Germany); Christoph Wagner (TU Ilmenau, Germany); Fabian Krieg and Florian Roemer (Fraunhofer Institute for Nondestructive Testing IZFP & TU Ilmenau, Germany); Giovanni Del Galdo (Fraunhofer Institute for Integrated Circuits IIS & TU Ilmenau, Germany)
- A2.2** **Edge and Cloud-aided Secure Sparse Representation for Face Recognition**  
 Yitu Wang, Takayuki Nakachi and Hiroyuki Ishihara (NTT, Japan)
- A2.3** **Multiple K-Means Clustering Based Locally Low-Rank Approach to Nonlinear Matrix Completion**  
 Kastumi Konishi (Hosei University, Japan); Tomoki Shise, Ryohei Sasaki and Toshihiro Furukawa (Tokyo University of Science, Japan)
- A2.4** **Convex Combination of Spline Adaptive Filters**  
 Michele Scarpiniti and Danilo Comminiello (Sapienza University of Rome, Italy); Aurelio Uncini (University of Rome "La Sapienza", Italy)
- A2.5** **L0-Norm Adaptive Volterra Filters**  
 Hamed Yazdanpanah (University of São Paulo, Brazil); Alberto Carini (Università di Trieste, Italy); Markus V. S. Lima (Universidade Federal do Rio de Janeiro, Brazil)
- A2.6** **Fast Basis Function Estimators for Identification of Nonstationary Stochastic Processes**  
 Maciej Niedźwiecki, Marcin Ciolek and Artur Gancza (Gdansk University of Technology, Poland)
- A2.7** **Parameter-free Small Variance Asymptotics for Dictionary Learning**  
 Hong Phuong Dang (CREST - UMR 9194, Ensaï, France); Clément Elvira (Univ Rennes, CNRS, Inria, IRISA, France)
- A2.8** **Measure-Transformed Gaussian Quasi Score Test in the Presence of Nuisance Parameters**  
 Koby Todros (Ben Gurion University of the Negev, Israel)

## POSTER AREA 3

## SPCN PI:

## Signal Processing for Communications

Chair: Ana Pérez-Neira (CTTC, Spain)

- A3.1** **All-Powerful Learning Algorithm for the Priority Access in Cognitive Network**  
 Mahmoud Almasri and Ali Mansour (ENSTA Bretagne, France); Christophe Moy (Universite de Rennes 1 & IETR, France); Ammar Assoum (Lebanese University, Lebanon); Christophe Osswald and Denis Le Jeune (ENSTA Bretagne, France)
- A3.2** **OFDM Spectral Precoding with Per-Subcarrier Distortion Constraints**  
 Khawar Hussain and Roberto López-Valcarce (Universidad de Vigo, Spain)
- A3.3** **An Algebraic Framework for Digital Envelope Modulation**  
 Simon Bicaïs and Jean-Baptiste Doré (CEA, France)

- A3.4** **Evaluation of Analog Encoding for Multi-User Wireless Transmission of Still Images**  
Jose Balsa, Óscar Fresnedo, Tomás Domínguez-Bolaño, José A. García-Naya and Luis Castedo (University of A Coruña, Spain)
- A3.5** **Deep Log-Likelihood Ratio Quantization**  
Marius Arvinte (University of Texas at Austin, USA); Ahmed Tewfik (University of Texas, Austin, USA); Sriram Vishwanath (University of Texas Austin, USA)
- A3.6** **Node Activity Monitoring in Heterogeneous Networks Using Energy Sensors**  
Jesus Perez, Javier Vía and Luis Vielva (University of Cantabria, Spain)
- A3.7** **Jammer Detection in M-QAM-OFDM by Learning a Dynamic Bayesian Model for the Cognitive Radio**  
Ali Krayani and Muhammad Farrukh Shahid (University of Genova, Italy); Mohamad Baydoun (University of Genoa, Italy); Lucio Marcenaro (Università degli Studi di Genova, Italy); Yue Gao (Queen Mary University of London, United Kingdom (Great Britain)); Carlo S Regazzoni (University of Genoa, Italy)

**12:40 - 13:40** **Lunch break**

**13:40 - 15:40**

**ROOM 1**

**SS8: Acoustic Scene Analysis and Signal Enhancement Based on Advanced Signal Processing and Machine Learning**

Organizers: Shoji Makino, Nobutaka Ono

Chairs: Shoji Makino (University of Tsukuba, Japan), Nobutaka Ono (Tokyo Metropolitan University, Japan)

**13:40**

**Acoustic Source Position Estimation Based on Multi-Feature Gaussian Processes**

Andreas Brendel and Ingo Altmann (University Erlangen-Nürnberg, Germany); Walter Kellermann (University Erlangen-Nuremberg, Germany)

**14:00**

**Comparison of Parameter Estimation Methods for Single-Microphone Multi-Frame Wiener Filtering**

Dörte Fischer, Klaus Brümman and Simon Doclo (University of Oldenburg, Germany)

**14:20**

**Efficient Full-Rank Spatial Covariance Estimation Using Independent Low-Rank Matrix Analysis for Blind Source Separation**

Yuki Kubo, Norihiro Takamune, Daichi Kitamura and Hiroshi Saruwatari (The University of Tokyo, Japan)



**14:40**

**Wavelength Proportional Arrangement of Virtual Microphones Based on Interpolation/Extrapolation for Underdetermined Speech Enhancement**  
Ryoga Jinzai (University of Tsukuba, Japan); Kouei Yamaoka (Tokyo Metropolitan University, Japan); Mitsuo Matsumoto, Shoji Makino and Takeshi Yamada (University of Tsukuba, Japan)

**15:00**

**Fast Multichannel Source Separation Based on Jointly Diagonalizable Spatial Covariance Matrices**  
Kouhei Sekiguchi (RIKEN AIP & Kyoto University, Japan); Aditya Arie Nugraha (Center for Advanced Intelligence Project (AIP), RIKEN, Japan); Yoshiaki Bando (National Institute of Advanced Industrial Science and Technology, Japan); Kazuyoshi Yoshii (Kyoto University & RIKEN, Japan)

**15:20**

**Multi-Microphone Speaker Separation Based on Deep DOA Estimation**  
Shlomo E. Chazan, Hodaya Hammer, Gershon Hazan, Jacob Goldberger and Sharon Gannot (Bar-Ilan University, Israel)

**ROOM 2**

**SPMuS LIV:**

**Robust Array Processing**

Chair: Geert Leus (Delft University of Technology, The Netherlands)

**13:40**

**Robust ToA-Based Localization in a Mixed LOS/NLOS Environment Using Hybrid Mapping Technique**  
Sanaa S.A. Al-Samahi and Dominic K. C. Ho (University of Missouri, USA); Naz Islam (University of Missouri-Columbia, USA)

**14:00**

**Outlier Detection from Non-Smooth Sensor Data**  
Timo Huuhtanen, Henrik Ambos and Alexander Jung (Aalto University, Finland)

**14:20**

**Robust Subspace Tracking with Missing Data and Outliers via ADMM**  
Le Trung Thanh (Vietnam National University, Hanoi, Vietnam); Viet-Dung Nguyen (University of Paris Saclay, France); Nguyen Linh Trung (Vietnam National University, Hanoi, Vietnam); Karim Abed-Meraim (Polytech'Orléans & University of Sharjah, UAE, France)

**14:40**

**Block Sparsity-Based DOA Estimation with Sensor Gain and Phase Uncertainties**  
Huiping Huang (Darmstadt University of Technology, Germany); Michael Fauß (Technische Universität Darmstadt, Germany); Abdelhak M Zoubir (Darmstadt University of Technology, Germany)

**15:00**

**Robust Self-Localization of Microphone Arrays Using a Minimum Number of Acoustic Sources**  
Matthias Schrammen (RWTH Aachen University, Germany); Ahmad Hamad (University of Siegen, Germany); Peter Jax (RWTH Aachen University, Germany)

# Thursday

15:20

## Auto-calibration of Uniform Linear Array Antennas

Tomas McKelvey (Chalmers University of Technology, Sweden)

ROOM 3

## BISA LV: Neural Networks in Biomedicine

Chair: Ahmed Tewfik (University of Texas, Austin, USA)

13:40

## A Novel Recurrent Neural Network Architecture for Classification of Atrial Fibrillation Using Single-lead ECG

Rohan Banerjee, Avik Ghose and Sundeep Khandelwal  
(Tata Consultancy Services, India)

14:00

## Classification of Brainwaves Using Convolutional Neural Network

Swapnil R Joshi (University of Missouri, Columbia, USA); Drew Headley (The State University of New Jersey, USA); Dominic K. C. Ho (University of Missouri, USA); Satish Nair (University of Missouri, Columbia, USA); Denis Paré (The State University of New Jersey, USA)

14:20

## Predicting the Success of Blastocyst Implantation from Morphokinetic Parameters Estimated Through CNNs and Sum of Absolute Differences

Julio Silva-Rodríguez (Instituto de Investigación e Innovación en Bioingeniería, I3B & Universitat Politècnica de Valencia, Spain); Adrián Colomer (Universitat Politècnica de València, Spain); Marcos Meseguer (Instituto Valenciano de Infertilidad, Universidad de Valencia, Spain); Valery Naranjo (Polytechnic University of Valencia, Spain)

14:40

## Towards Automatic Glaucoma Assessment: An Encoder-decoder CNN for Retinal Layer Segmentation in Rodent OCT Images

Rocío del Amor (University of Valencia, Spain); Sandra Morales and Adrián Colomer (Universitat Politècnica de València, Spain); Jose M. Mossi (Polytechnic University of Valencia, Spain); David Woldbye (Laboratory of Neural Plasticity, University of Copenhagen, Denmark); Kristian Klemp (Rigshospitalet-Glostrup, Denmark); Michael Larsen (University of Copenhagen, Denmark); Valery Naranjo (Polytechnic University of Valencia, Spain)

15:00

## Segmentation of Head and Neck Tumour Using Modified U-net

Baixiang Zhao, John J Soraghan and Gaetano Di Caterina (University of Strathclyde, United Kingdom (Great Britain)); Derek Grose (Beatson Oncology Unit, NHS Greater Glasgow and Clyde, United Kingdom (Great Britain))

15:20

## Inhomogeneously Stacked RNN for Recognizing Hand Gestures from Magnetometer Data

Philipp Koch (University of Lübeck, Germany); Mark Dreier (Universität zu Lübeck, Germany); Martina Böhme and Marco Maass (University of Lübeck, Germany); Huy Phan (University of Kent, United Kingdom (Great Britain)); Alfred Mertins (Institute for Signal and Image Processing, University of Luebeck, Germany)

## ROOM 4

### SiG-DML LV:

### Machine Learning for Robotics

Chair: Walter Kellermann  
(University Erlangen-Nuremberg, Germany)

**13:40**

#### Acoustic Simulation in Dynamic Environments for Robot Audition

Zhaofeng Zhang (Honda R&D Co., Ltd., Japan); Kazuhiro Nakadai (Honda Research Institute Japan Co., Ltd. & Tokyo Institute of Technology, Japan); Hirofumi Nakajima (Kogakuin University, Japan); Naoaki Sumida (Honda Research Institute Japan Co., Ltd., Japan)

**14:00**

#### Active Acoustic Source Tracking Exploiting Particle Filtering and Monte Carlo Tree Search

Thomas Haubner (Friedrich-Alexander University Erlangen-Nürnberg (FAU), Germany); Alexander Schmidt (University of Erlangen-Nuremberg, Germany); Walter Kellermann (University Erlangen-Nuremberg, Germany)

**14:20**

#### Extracting Proprioceptive Information by Analyzing Rotating Range Sensors Induced Distortion

Damien Vivet (ISAE-SUPAERO, France)

**14:40**

#### Deep Reinforcement Learning for Autonomous Model-Free Navigation with Partial Observability

Daniel Tapia and Juan Parras (Universidad Politécnica de Madrid, Spain); Santiago Zazo (Universidad Politecnica Madrid, Spain)

**15:00**

#### Antenna Controller for Low-Latency and High Reliability Robotic Communications over Time-Varying Fading Channels

Daniel Bonilla Licea (Université Internationale de Rabat, Morocco); Mounir Ghogho (International University of Rabat, Morocco & University of Leeds, United Kingdom (Great Britain)); Desmond McLernon (The University of Leeds, United Kingdom (Great Britain)); Syed Ali Raza Zaidi (University of Leeds, United Kingdom (Great Britain))

**15:20**

#### Sound-based Distance Estimation for Indoor Navigation in the Presence of Ego Noise

Usama Saqib and Jesper Rindom Jensen (Aalborg University, Denmark)

## AUDITORIUM ARAO

### TMTSP LV:

### Sparse Dictionary Learning

Chair: Herwig Wendt  
(University of Toulouse, CNRS, France)

**13:40**

#### L0Soft: L0 Minimization via Soft Thresholding

Mostafa Sadeghi (Inria Grenoble Rhône-Alpes, France); Fateme Ghayem (Sharif University Of Technology, Iran); Massoud Babaie-Zadeh (Sharif University of Technology, Iran); Saikat Chatterjee (KTH - Royal Institute of Technology & Communication Theory Lab, Sweden); Mikael Skoglund (KTH Royal Institute of Technology, Sweden); Christian Jutten (GIPSA-Lab, France)

## Thursday

14:00

### **Spectrum Insensitive Sparse Recovery with Iterative Affine Projections**

Nicolae Cleju (Gheorghe Asachi Technical University of Iasi, Romania); Iulian B. Ciocoiu (GHEORGHE ASACHI Technical University of Iasi, Romania)

14:20

### **Atomic Norms in Group Sliding Sparse Recovery**

Carlos Buelga and David Gregoratti (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain); Xavier Mestre (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain)

14:40

### **Learning Tensor-structured Dictionaries with Application to Hyperspectral Image Denoising**

Cássio F Dantas (INRIA Rennes - Bretagne Atlantique, France); Jeremy Cohen (CNRS, France); Rémi Gribonval (INRIA, France)

15:00

### **Hyperspectral and Multispectral Image Fusion Based on a Non-locally Centralized Sparse Model and Adaptive Spatial-Spectral Dictionaries**

Kevin Arias, Edwin Vargas and Henry Arguello Fuentes (Universidad Industrial de Santander, Colombia)

15:20

### **Hyper-parameter Selection on Convolutional Dictionary Learning Through Local $\ell_{0,\infty}$ Norm**

Gustavo Silva and Jorge Quesada (Pontificia Universidad Católica del Perú, Peru); Paul Rodriguez (Pontificia Universidad Católica del Perú, Peru)

## POSTER AREA 1

### ASMSP PIII: A

### Cooustic Signal Processing;

Chair: Richard Hendriks (Delft University of Technology, The Netherlands)

A1.1

### **Sensor Selection and Rate Distribution Based Beamforming in Wireless Acoustic Sensor Networks**

Zhang Jie, Richard Heusdens and Richard Hendriks (Delft University of Technology, The Netherlands)

A1.2

### **Permutation Alignment Based on MUSIC Spectrum Discrepancy for Blind Source Separation**

Yuuki Tachioka (Denso IT Laboratory, Japan)

A1.3

### **MWF-based Speech Dereverberation with a Local Microphone Array and an External Microphone**

Randall Ali, Toon van Waterschoot and Marc Moonen (KU Leuven, Belgium)

A1.4

### **Replay Attack Detection Using Generalized Cross-Correlation of Stereo Signal**

Ryoya Yaguchi, Sayaka Shiota, Nobutaka Ono and Hitoshi Kiya (Tokyo Metropolitan University, Japan)

- A1.5** **Generalized Multichannel Variational Autoencoder for Underdetermined Source Separation**  
Shogo Seki (Nagoya University, Japan); Hirokazu Kameoka (Nippon Telegraph and Telephone Corporation, Japan); Li Li (University of Tsukuba, Japan); Tomoki Toda and Kazuya Takeda (Nagoya University, Japan)
- A1.6** **Distributed Adaptive Node-Specific Signal Estimation in a Wireless Sensor Network with Partial Prior Knowledge of the Desired Source Steering Vector**  
Robbe Van Rompaey (KU Leuven & Fonds voor Wetenschappelijk Onderzoek Vlaanderen (FWO), Belgium); Marc Moonen (KU Leuven, Belgium)
- A1.7** **Non-Intrusive POLQA Estimation of Speech Quality Using Recurrent Neural Networks**  
Dushyant Sharma (Nuance Communications, USA); Aidan O. T. Hogg (Imperial College London, United Kingdom (Great Britain)); Yu Wang (University of Cambridge, United Kingdom (Great Britain)); Amr Nour-Eldin (Nuance Communications Inc, Canada); Patrick A Naylor (Imperial College London, United Kingdom (Great Britain))
- A1.8** **Computational Acceleration and Smart Initialization of Full-rank Spatial Covariance Analysis**  
Hiroshi Sawada, Rintaro Ikeshita, Nobutaka Ito and Tomohiro Nakatani (NTT Corporation, Japan)
- A1.9** **Referenceless Performance Evaluation of Audio Source Separation Using Deep Neural Networks**  
Emad M. Grais (University of Surrey, United Kingdom (Great Britain) & Helwan University, Egypt); Hagen Wierstorf, Dominic Ward, Russell Mason and Mark D. Plumbley (University of Surrey, United Kingdom (Great Britain))
- A1.10** **A Unifying Framework for Blind Source Separation Based on A Joint Diagonalizability Constraint**  
Rintaro Ikeshita (NTT Corporation, Japan); Nobutaka Ito (NTT, Japan); Tomohiro Nakatani and Hiroshi Sawada (NTT Corporation, Japan)
- A1.11** **Automatic Measurement of Speech Breathing Rate**  
Mohamed Ismail Yasar Arafath K (Indian Institute of Technology Kharagpur, India); Aurobinda Routray (Indian Institute of Technology, Kharagpur, India)
- A1.12** **A New Metric to Evaluate Auditory Attention Detection Performance Based on a Markov Chain**  
Simon Geirnaert (KU Leuven, Belgium); Tom Francart (Katholieke Universiteit Leuven, Belgium); Alexander Bertrand (KU Leuven, Belgium)

- A2.1** **Lossless Image Coding Exploiting Local and Non-local Information via Probability Model Optimization**  
Kyohei Unno (KDDI Research, Inc. & Tokyo University of Science, Japan); Yusuke Kameda, Ichiro Matsuda and Susumu Itoh (Tokyo University of Science, Japan); Sei Naito (KDDI Research, Inc., Japan)
- A2.2** **Gaze Tracking by Joint Head and Eye Pose Estimation Under Free Head Movement**  
Stefania Cristina and Kenneth P. Camilleri (University of Malta, Malta)
- A2.3** **Graph Spectral Domain Features for Static Hand Gesture Recognition**  
Basheer Alwaely and Charith Abhayaratne (The University of Sheffield, United Kingdom (Great Britain))
- A2.4** **Target Identification from Coded Diffraction Patterns via Template Matching**  
Andrés Jerez, Samuel Pinilla, Hans Garcia and Henry Arguello (Universidad Industrial de Santander, Colombia)
- A2.5** **A Biologically Constrained Encoding Solution for Long-Term Storage of Images onto Synthetic DNA**  
Melpomeni Dimopoulou (I3S/CNRS, France); Marc Antonini (Université de Nice Sophia Antipolis, France); Pascal Barbry (IPMC/CNRS, France); Raja Appuswamy (EURECOM, France)
- A2.6** **Free Registration Based Shape Prior for Active Contours**  
Sakly Ines (Cristal Laboratory, GRIFT Research Group, Tunisia); Mohamed Amin Mezghich (National School of Computer Sciences Manouba, Tunisia); Slim M'hiri and Faouzi Ghorbel (CRISTAL Laboratory, GRIFT research group, Tunisia)
- A2.7** **Low-Rank Approximation via the Generalized Reweighted Iterative Nuclear Norm**  
Yan Huang (Southeast University, Nanjing, P.R. China); Lan Lan (Xidian University, P.R. China); Lei Zhang (National Laboratory of Radar Signal Processing, Xidian University, P.R. China)

## POSTER AREA 3

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### SPCN PII:

### Channel State Estimation

Chair: Christoph F Mecklenbräuer  
(Vienna University of Technology, Austria)

- A3.1** **A Robust Group-Sparse Proportionate Affine Projection Algorithm with Maximum Correntropy Criterion for Channel Estimation**  
Zhengxiong Jiang and Yingsong Li (Harbin Engineering University, P.R. China); Yury Zakharov (University of York, United Kingdom (Great Britain))
- A3.2** **Maximum-likelihood Detection of Impulsive Noise Support for Channel Parameter Estimation**  
Xavier Mestre (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain); Miquel Payaró (CTTC, Spain); Deep Shrestha (UPC, Spain)

- A3.3** **Underwater Acoustic Channel Estimation and Equalization via Adaptive Filtering and Sparse Approximation**  
 Mariane R Petraglia (Federal University of Rio de Janeiro, Brazil)
- A3.4** **Spectrum Sensing by Higher-Order SVM-based Detection**  
 Angelo Coluccia and Alessio Fascista (University of Salento, Italy); Giuseppe Ricci (Universita' del Salento, Italy)
- A3.5** **Novel Sensing Mechanism for Full-Duplex Secondary Users in Cognitive Radio**  
 Mohamad Rida Mortada (Ensta-Bretagne, Lebanon); Abbass Nasser (Ensta-Bretagne, France & AUCE, Lebanon); Ali Mansour (ENSTA Bretagne, France); Koffi-Clement Yao (Université de Bretgane Occidentale, France)
- A3.6** **Intersymbol and Intercarrier Interference in OFDM Transmissions Through Highly Dispersive Channels**  
 Wallace A. Martins (Federal University of Rio de Janeiro, Brazil); Fernando Cruz-Roldán (Universidad Alcalá, Spain); Marc Moonen (KU Leuven, Belgium); Paulo Diniz (UniversidadeFederal do Rio de Janeiro, Brazil)
- A3.7** **Hybrid FSO/RF-FSO Systems over Generalized Malaga Distributed Channels with Pointing Errors**  
 Banibrata Bag and Akinchan Das (Haldia Institute of Technology, India); Chayanika Bose (Reader, India); Aniruddha Chandra (National Institute of Technology, Durgapur, WB, India)

**15:40 - 16:10**      **Coffee break**

**16:10 - 17:50**

## ROOM 1

### **VIP LV: Image Feature Extraction**

Chair: Anastasios Tefas  
 (Aristotle University of Thessaloniki, Greece)

**16:10**

#### **Improved Lossless Image Compression Using Adaptive Image Rotation**

Phillip Möller (Deutsche Telekom IT GmbH, Germany); Tilo Strutz (Leipzig University of Telecommunications (HfTL), Germany)

**16:30**

#### **An Improved Feature Extraction Method for Texture Classification with Increased Noise Robustness**

Stefania Ramona Barburiceanu (Technical University of Cluj-Napoca & Faculty of Electronics, Telecommunications and Information Technology, Romania); Serban Meza (Technical University Cluj-Napoca, Romania); Christian Germain (University of Bordeaux, France); Romulus Terebes (Technical University of Cluj-Napoca, Romania)

# Thursday

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16:50

## **An Ensemble Learning Approach for the Classification of Remote Sensing Scenes Based on Covariance Pooling of CNN Features**

Sara Akodad (IMS, France); Solène Vilfroy and Lionel Bombrun (University of Bordeaux, France); Charles Casimiro Cavalcante (Federal University of Ceará, Brazil); Christian Germain and Yannick Berthoumieu (University of Bordeaux, France)

17:10

## **Texture Superpixel Clustering from Patch-based Nearest Neighbor Matching**

Remi Giraud (Bordeaux INP, France); Yannick Berthoumieu (University of Bordeaux, France)

17:30

## **One-Class Feature Learning Using Intra-Class Splitting**

Patrick Schlachter (University of Stuttgart, Germany); Yiwen Liao (University of Stuttgart & Institute of Signal Processing and System Theory, Germany); Bin Yang (University of Stuttgart, Germany)

## **ROOM 2**

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## **ASMSP LV: Model Based Audio Signal Processing**

Chair: Rainer Martin (Ruhr-University Bochum, Germany)

16:10

## **Bayesian Model Selection for Nonlinear Acoustic Echo Cancellation**

Mhd Modar Halimeh (Friedrich-Alexander-University Erlangen-Nürnberg, Germany); Andreas Brendel (University Erlangen-Nürnberg, Germany); Walter Kellermann (University Erlangen-Nuremberg, Germany)

16:30

## **Spectral Complexity Reduction of Music Signals for Cochlear Implant Users Based on Subspace Tracking**

Johannes Gauer (Ruhr University Bochum, Germany); Ekaterina Krymova and Denis Belomestny (Duisburg-Essen University, Germany); Rainer Martin (Ruhr-University Bochum, Germany)

16:50

## **Ad-hoc Mobile Array Based Audio Segmentation Using Latent Variable Stochastic Model**

Srikanth Raj Chetupalli (Indian Institute of Science, India); Anirban Bhowmick (IISc Bangalore, India); Thippur Sreenivas (IISc, India)

17:10

## **Monaural Source Separation Based on Sequentially Trained LSTMs in Real Room Environments**

Yi Li, Yang Sun and Syed Mohsen Naqvi (Newcastle University, United Kingdom (Great Britain))

17:30

## **Model-based Optimization of a Low-dimensional Modulation Filter Bank for DRR and T60 Estimation**

Semih Ağcaer and Rainer Martin (Ruhr-University Bochum, Germany)



## ROOM 3

### SPMuS LV: Signal and Image Processing Applications

Chair: Arie Yeredor (Tel-Aviv University, Israel)

**16:10**

#### Matrix Cofactorization for Joint Unmixing and Classification of Hyperspectral Images

Adrien Lagrange and Mathieu Fauvel (University of Toulouse, France); Stéphane May (CNES, France); Jose Bioucas (Instituto de Telecomunicoes, Portugal); Nicolas Dobigeon (University of Toulouse, France)

**16:30**

#### Bayesian Estimation of Recurrent Changepoints for Signal Segmentation and Anomaly Detection

Christian Reich (University of Siegen & Robert Bosch GmbH, Germany); Christina Nicolaou (University of Siegen & Robert Bosch GmbH, Germany); Ahmad Mansour (Robert Bosch GmbH, Germany); Kristof Van Laerhoven (University of Siegen, Germany)

**16:50**

#### Single Image Ear Recognition Using Wavelet-Based Multi-Band PCA

Matthew Zarachoff, Akbar Sheikh-Akbari and Dorothy Monekosso (Leeds Beckett University, United Kingdom (Great Britain))

**17:10**

#### Analysis of Nematodes in Coffee Crops at Different Altitudes Using Aerial Images

Alexandre Oliveira and Gleice Assis (Federal University of Uberlândia, Brazil); Elaine Faria (Universidade Federal de Uberlândia, Brazil); Kelen Vivaldini (Federal University of São Carlos, Brazil); Vitor Guizilini and Fabio Ramos (University of Sydney, Australia); Caio Mendes (USP-Sao Carlos, Brazil); Denis F. Wolf (University of Sao Paulo - USP & Institute of Mathematics and Computer Science, Brazil); Jefferson Souza (Federal University of Uberlândia, Brazil)

**17:30**

#### Compression of High-Dimensional Multispectral Image Time Series Using Tensor Decomposition Learning

Anastasia Aidini (University of Crete & Foundation for Research and Technology-Hellas, Greece); Grigorios Tsagkatakis (FORTH, Greece); Panagiotis Tsakalides (FORTH-ICS and University of Crete, Greece)

## ROOM 4

### SPCN LIV: Internet of Things

Chair: Mounir Ghogho (UIR, Morocco)

**16:10**

#### Spatial Inference in Sensor Networks Using Multiple Hypothesis Testing and Bayesian Clustering

Martin Gölz (Darmstadt University of Technology, Germany & Aalto University, Finland); Michael Muma (Darmstadt University of Technology, Germany); Topi Halme (Aalto University, Finland); Abdelhak M Zoubir (Darmstadt University of Technology, Germany); Visa Koivunen (Aalto University, Finland)

## Thursday

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**16:30**

### **A Low Complexity Image Compression Algorithm for IoT Multimedia Applications**

Giuseppe Campobello and Antonino Segreto (University of Messina, Italy)

**16:50**

### **GestureKeeper: Gesture Recognition for Controlling Devices in IoT Environments**

Vasileios Sideridis (Foundation for Research and Technology-Hellas (FORTH), Greece); Andrew Zacharakis (University of Crete, Greece); George Tzagkarakis (Foundation for Research and Technology-Hellas (FORTH), Greece & University of Bordeaux (IRGO), France); Maria Papadopouli (University of Crete, Greece)

**17:10**

### **Cost-Aware Dual Prediction Scheme for Reducing Transmissions at IoT Sensor Nodes**

Victor Håkansson (NTNU, Norway); Naveen K. D. Venkatesh and Frank Alexander Kraemer (Norwegian University of Science and Technology, Norway); Stefan Werner (NTNU, Norway)

**17:30**

### **Optimum Trajectory Planning for Robotic Data Ferries in Delay Tolerant Wireless Sensor Networks**

Edmond Nurellari (University of Lincoln, United Kingdom (Great Britain)); Daniel Bonilla Licea (Université Internationale de Rabat, Morocco); Mounir Ghogho (International University of Rabat, Morocco & University of Leeds, United Kingdom (Great Britain))

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## **AUDITORIUM ARAO**

### **TMTSP LVI: Time-Frequency Methods**

Chair: Richard Heusdens (Delft University of Technology, The Netherlands)

**16:10**

### **Tracking Recurring Patterns in Time Series Using Dynamic Time Warping**

Rik A van der Vlist (Delft University of Technology & Qubry, The Netherlands); Cees Taal (Qubry, The Netherlands); Richard Heusdens (Delft University of Technology, The Netherlands)

**16:30**

### **Shuffling for Understanding Multifractality - Application to Asset Price Time Series**

Patrice Abry (Ecole Normale Supérieure, Lyon, France); Herwig Wendt (University of Toulouse, CNRS, France); Yannick Malevergne (Université Paris 1 Panthéon-Sorbonne, France); Marc Senneret, Laurent Jaffres and Blaise Liaustrat (Vivienne Investissement, France)

**16:50**

### **Second-Order Time-Reassigned Synchrosqueezing Transform: Application to Drapner Wave Analysis**

Dominique Fourer (IBISC, University of Evry/Paris-Saclay, France); Francois Auger (IUT Saint Nazaire, France)

17:10

## Filtering-based Analysis Comparing the DFA with the CDFA for Wide Sense Stationary Processes

Bastien Berthelot (Thales AVS France & IMB UMR CNRS 5251 - INRIA, France); Eric J. Grivel (Université de Bordeaux, France); Pierrick Legrand (University of Bordeaux, Inria Bordeaux Sud-Ouest, Institute of Mathematics of Bordeaux, France); Jean-Marc André (Bordeaux INP, France); Patrick Mazoyer and Thierry Ferreira (Thales AVS France, France)

17:30

## 2D Fourier Transform Based Analysis Comparing the DFA with the DMA

Bastien Berthelot (Thales AVS France & IMB UMR CNRS 5251 - INRIA, France); Eric J. Grivel (Université de Bordeaux, France); Pierrick Legrand (University of Bordeaux, Inria Bordeaux Sud-Ouest, Institute of Mathematics of Bordeaux, France); Marc Donias (IMS Laboratory - University Bordeaux, France); Jean-Marc André (Bordeaux INP, France); Patrick Mazoyer and Thierry Ferreira (Thales AVS France, France)

### POSTER AREA 1

### SiG-DML PIII:

### Applications of Machine Learning;

Chair: Franz Hlawatsch

(Vienna University of Technology, Austria)

A1.1

#### Spectrogram Feature Losses for Music Source Separation

Abhimanyu Sahai (ETH Zurich, Switzerland); Romann Weber and Brian McWilliams (Disney Research, Switzerland)

A1.2

#### Data Preprocessing for ANN-based Industrial Time-Series Forecasting with Imbalanced Data

Ivan Pisa, Ignacio Santin and Jose Vicario (Universitat Autònoma de Barcelona, Spain); Antoni Morell (Universitat Autònoma de Barcelona (UAB), Spain); Ramon Vilanova (Universitat Autònoma de Barcelona, Spain)

A1.3

#### Spatial and Hierarchical Riemannian Dimensionality Reduction and Dictionary Learning for Segmenting Multichannel Images

Faezeh Fallah (University of Stuttgart, Germany); Karim Armanious (Institute of Signal Processing and System Theory, Germany); Bin Yang (University of Stuttgart, Germany); Fabian Bamberg (Center for Diagnostic and Therapeutic Radiology, Germany)

A1.4

#### A Machine Learning Approach to the Identification of Dynamical Nonlinear Systems

Laura Falaschetti, Giorgio Biagetti, Paolo Crippa and Claudio Turchetti (Università Politecnica delle Marche, Italy)

A1.5

#### Improving Energy Disaggregation Performance Using Appliance-Driven Sampling Rates

Pascal Alexander Schirmer and Iosif Mporas (University of Hertfordshire, United Kingdom (Great Britain))

- A1.6** **Learning of Image Dehazing Models for Segmentation Tasks**  
Sébastien de Blois, Ihsen Hedhli and Christian Gagné  
(Université Laval, Canada)
- A1.7** **A Highly Reliable Wrist-Worn Acceleration-Based Fall Detector**  
Majd Saleh (University of Rennes 1, LTSI and INSERM, France); Nawras Georgi  
(Université de Rennes 1, France); Manuel Abbas (University of Rennes 1, LTSI  
and INSERM, France); Régine Le Bouquin Jeannès  
(Université de Rennes 1, France)
- A1.8** **Joint User Grouping and Power Allocation for MISO Systems: Learning to Schedule**  
Yaxiong Yuan, Thang X. Vu, Lei Lei and Symeon Chatzinotas (University of  
Luxembourg, Luxembourg); Björn Ottersten  
(University of Luxembourg, Luxembourg)
- A1.9** **Deep Complex Neural Network Learning for High-Voltage Insulation Fault Classification from Complex Bispectrum Representation**  
Imene Mitiche and Mark David Jenkins (Glasgow Caledonian University,  
United Kingdom (Great Britain)); Philip Boreham (Doble Engineering, United  
Kingdom (Great Britain)); Alan Nesbitt and Gordon Morison (Glasgow  
Caledonian University, United Kingdom (Great Britain))

## POSTER AREA 2

## BISA PIV:

## EEG Analysis

Chair: Vicente Zarzoso  
(IUT Nice - Côte d'Azur, France)

- A2.1** **Identify Spatial Similarity of Electroencephalography (EEG) During Working-Memory Maintenance**  
Xiaoliang Gong, Yufan Song, ZhiHong Zhang and Te Hu (Tongji University, P.R. China);  
Asoke K Nandi (Brunel University London, United Kingdom (Great Britain))
- A2.2** **Perception of Non-Native Phoneme Contrasts in 8-13 Months Infants Tensor-Based Analysis of EEG Signals**  
Tomasz Piotrowski (Nicolaus Copernicus University, Poland); Bibiana Bałaj, Joanna  
Dreszer and Monika Lewandowska (Faculty of Humanities, Nicolaus Copernicus  
University, Poland); Rafał Milner (World Hearing Center, Institute of Physiology  
and Pathology of Hearing, Poland); Natalia Pawlaczyk (Faculty of Psychology, University  
of Warsaw, Poland); Magdalena Szmytko (Faculty of Educational Sciences, University  
of Lodz, Poland); Mansoureh Aghabeig (Faculty of Physics, Astronomy & Informatics,  
Poland); Wlodek Duch (Nicolaus Copernicus University, Poland)
- A2.3** **Labeler-hot Detection of EEG Epileptic Transients**  
Daniel Wesierski (Gdansk University of Technology, Poland); Lukasz Czekaj (Elmiko  
Biosignals, Poland); Anna Jezierska (Systems Research Institute, Polish Academy  
of Science, Poland); Pawel Jezierski (Institute of Psychiatry and Neurology, Poland);  
Pawel Swiniarski, Wojciech Ziembła, Anna Kolodziejak, Pawel Ogniewski and  
Pawel Niedbalski (Elmiko Biosignals, Poland)

- A2.4** **Alcoholic EEG Analysis Using Riemann Geometry Based Framework**  
Gopika Gopan K (International Institute of Information Technology, Bangalore, India); Neelam Sinha (International Institute of Information Technology & Bangalore, India); Dinesh Babu Jayagopi (IIIT Bangalore, India)
- A2.5** **Modified U-Net for Automatic Brain Tumor Regions Segmentation**  
Keerati Kaewrak (University of Strathclyde, United Kingdom (Great Britain))
- A2.6** **Perfusion-based Brain Connectivity: PASL Vs pCASL**  
Bianca De Blasi (University College London, United Kingdom (Great Britain)); Anna Barnes (University College London Hospitals, United Kingdom (Great Britain)); Silvia Francesca Storti (University of Verona, Italy); Matthias Koepp (University College London, United Kingdom (Great Britain)); Gloria Menegaz (University of Verona, Italy); Enrico De Vita (King's College London, United Kingdom (Great Britain)); Ilaria Boscolo Galazzo (University of Verona, Italy)
- A2.7** **Detecting Early Parkinson's Disease from Keystroke Dynamics Using the Tensor-Train Decomposition**  
Hooman Oroojeni M. J. (Goldsmiths University of London, United Kingdom (Great Britain)); James Oldfield (Goldsmiths, University of London, United Kingdom (Great Britain)); Mihalis Nicolaou (The Cyprus Institute, United Kingdom (Great Britain))
- A2.8** **Analysis of Parkinson's Disease Dysgraphia Based on Optimized Fractional Order Derivative Features**  
Jan Mucha (Brno University of Technology, Czech Republic); Marcos Faundez-Zanuy (Escuela Superior Politecnica Tecnocampus, Spain); Jiri Mekyska, Vojtěch Zvončák, Zoltan Galaz, Tomas Kiska and Zdenek Smékal (Brno University of Technology, Czech Republic); Lubos Brabenec and Irena Rektorova (Masaryk University, Czech Republic); Karmele López-de-Ipiña (University of the Basque Country UPV/EHU, Spain)

**POSTER AREA 3**

**BISA PIII:**

**ECG & Cardio**

Chair: Riccardo Bernardini (University of Udine, Italy)

- A3.1** **Volumetric Surface-guided Graph-based Segmentation of Cardiac Adipose Tissues on Fat-Water MR Images**  
Faezeh Fallah (University of Stuttgart, Germany); Karim Armanious (Institute of Signal Processing and System Theory, Germany); Bin Yang (University of Stuttgart, Germany); Fabian Bamberg (Center for Diagnostic and Therapeutic Radiology, Germany)  
Stress Detection Through Electrodermal Activity (EDA) and Electrocardiogram (ECG)
- A3.2** **Analysis in Car Drivers**  
Pamela Zontone, Antonio Affanni, Riccardo Bernardini, Alessandro Piras and Roberto Rinaldo (University of Udine, Italy)
- A3.3** **A Graph Signal Processing Framework for Atrial Activity Extraction**  
Miao Sun and Elvin Isufi (Delft University of Technology, The Netherlands); Natasja de Groot (Erasmus University Medical Center, The Netherlands); Richard Hendriks (Delft University of Technology, The Netherlands)

# Friday

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- A3.4** | **A Multitarget Tracking Method for Estimating Carotid Artery Wall Motion from Ultrasound Sequences**  
Jan Dorazil (Brno University of Technology (BUT), Czech Republic); Rene Repp and Thomas Kropfreiter (TU Wien, Austria); Richard Prüller (Institute of Telecommunications, TU Wien, Austria); Kamil Riha (Brno University of Technology, Czech Republic); Franz Hlawatsch (Vienna University of Technology, Austria)
- A3.5** | **Breathing Rate Complexity Features for "In-the-Wild" Stress and Anxiety Measurement**  
Abhishek Tiwari (INRS-EMT, Canada); Shrikanth Narayanan (University of Southern California, USA); Tiago Falk (INRS-EMT, Canada)
- A3.6** | **A Self-Tuned Architecture for Human Activity Recognition Based on a Dynamical Recurrence Analysis of Wearable Sensor Data**  
Michaela-Areti Zervou (FORTH-ICS & University of Crete, CSD, Greece); George Tzagkarakis (Foundation for Research and Technology-Hellas (FORTH), Greece & University of Bordeaux (IRGO), France); Athanasia Panousopoulou (Freelance Researcher, United Kingdom (Great Britain)); Panagiotis Tsakalides (FORTH-ICS and University of Crete, Greece)
- A3.7** | **Semi-Supervised Adaptive Learning for Decoding Movement Intent from Electromyograms**  
Henrique Dantas and V. John Mathews (Oregon State University, USA); David Warren (University Of Utah, USA)

## FRIDAY, SEPTEMBER 6<sup>TH</sup>

**9:00 - 10:00**      **PLENARY SPEAKERS**

**AUDITORIUM ARAO**

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**PLEN-4:**      **"Graph Neural Networks"**  
**Alejandro Ribeiro (Department of Electrical and Systems Engineering, University of Pennsylvania, Philadelphia, USA)**

Chair: Luis Castedo  
(University of A Coruña, Spain)

**10:00 - 10:30**      **Coffee break**

## 10:30 - 12:10

**ROOM 1****ASMSP LVI: Acoustic Source Localization**

Chair: Augusto Sarti (Politecnico di Milano, Italy)

10:30

**Variational Inference for DOA Estimation in Reverberant Conditions**

Yosef Soussana and Sharon Gannot (Bar-Ilan University, Israel)

10:50

**Indoor Sound Source Localization Based on Sparse Bayesian Learning and Compressed Data**

Zonglong Bai (Aalborg University, Denmark &amp; Harbin Institute of Technology, P.R. China); Jinwei Sun (Harbin Institute of Technology, P.R. China); Jesper Rindom Jensen and Mads Græsbøll Christensen (Aalborg University, Denmark)

11:10

**On the Relation Between DOA-Vector Eigenbeam ESPRIT and Subspace Pseudointensity-Vector**

Adrian Herzog and Emanuël Habets (International Audio Laboratories Erlangen, Germany)

11:30

**On Spectral Embeddings for Supervised Binaural Source Localization**

Maja Taseska and Toon van Waterschoot (KU Leuven, Belgium)

11:50

**Self-Localization of Distributed Microphone Arrays Using Directional Statistics with DoA Estimation Reliability**

Szymon Woźniak and Konrad Kowalczyk (AGH University of Science and Technology, Poland); Máximo Cobos (Universidad de Valencia, Spain)

**ROOM 2****SPMUS LVI: Signal Processing Over Graphs**

Chair: Remy Boyer (University of Lille &amp; CRISTAL, France)

10:30

**Learning Causal Networks Topology from Streaming Graph Signals**

Mircea Moscu (Université de Nice Sophia-Antipolis, France); Roula Nassif (EPFL, Switzerland); Fei Hua and Cédric Richard (Université de Nice Sophia-Antipolis, France)

10:50

**Enhanced Diffusion Learning over Networks**

Ricardo Merched (Universidade Federal do Rio de Janeiro, Brazil); Ali Sayed (Ecole Polytechnique Federale de Lausanne EPFL, School of Engineering, Switzerland); Stefan Vlaski (University of California, Los Angeles, USA)

11:10

**Topology Inference and Signal Representation Using Dictionary Learning**

Mahmoud Ramezani-Mayiami (University of Agder, Norway); Karl Skretting (Stavanger, Norway)

11:30

**Gated Graph Convolutional Recurrent Neural Networks**

Luana Ruiz, Fernando Gama and Alejandro Ribeiro (University of Pennsylvania, USA)

# Friday

11:50

## Privacy-Preserving Distributed Average Consensus Based on Additive Secret Sharing

Qiongxiu Li, Ignacio Cascudo and Mads Græsbøll Christensen (Aalborg University, Denmark)

**ROOM 3**

## VIP LVI: Video Coding

Chair: Giuseppe Valenzise (CNRS, France)

10:30

## Early SKIP Mode Decision Method in HEVC Based on Perceptual Distortion Measure

Jieon Kim (QMUL, United Kingdom (Great Britain)); Ebroul Izquierdo (Queen Mary, University of London, United Kingdom (Great Britain))

10:50

## Evaluation of Modifications to CPPPSNR in 360 Video Quality Assessment

Jayasingam Adhuran (University of Surrey, United Kingdom (Great Britain)); Gosala Kulupana (BBC, United Kingdom (Great Britain)); Chatura Galkandage (University of Surrey, United Kingdom (Great Britain)); Anil Fernando (Center for Communications Research, University of Surrey, United Kingdom (Great Britain))

11:10

## Fast CU Size Decisions for HEVC Inter-Prediction Using Support Vector Machines

Buddhiprabha Erabadda (University of Surrey, United Kingdom (Great Britain)); Thanuja Mallikarachchi (Cardiff Metropolitan University, United Kingdom (Great Britain)); Gosala Kulupana (University of Surrey, United Kingdom (Great Britain)); Anil Fernando (Center for Communications Research, University of Surrey, United Kingdom (Great Britain))

11:30

## HVS Based Perceptual Pre-Processing for Video Coding

Madhukar Bhat (VITEC & University of Nantes, France); Jean-Marc Thiesse (VITEC, France); Patrick Le Callet (Université de Nantes, France)

11:50

## A Temporal Dependency Model for Rate-Distortion Optimization in Video Coding

Jingning Han (Google, USA); Paul Wilkins and Yaowu Xu (Google, Inc., USA); James Bankoski (Google, USA)

**AUDITORIUM ARAO**

## TMTSP LVII: Adaptive Algorithms

Chair: Mohammed Nabil El Korso (Paris 10 University & LEME-EA 4416, France)

10:30

## Tracking Theory of Adaptive Filters with Input-Output Sampling Rate Offset

Philipp Thüne and GeraldENZner (Ruhr-Universität Bochum, Germany)



10:50

**A Simple Sparsity-aware Feature LMS Algorithm**

Gabriel S Chaves (Federal University of Rio de Janeiro, Brazil); Markus V. S. Lima (Universidade Federal do Rio de Janeiro, Brazil); Hamed Yazdanpanah (University of São Paulo, Brazil); Paulo Diniz (Universidade Federal do Rio de Janeiro, Brazil); Tadeu Ferreira (Fluminense Federal University, Brazil)

11:10

**Transient Analysis of Partitioned-Block Frequency-Domain Adaptive Filters**

Feiran Yang (Institute of Acoustics, Chinese Academy of Sciences, P.R. China); Gerald Enzner (Ruhr-Universität Bochum, Germany); Jun Yang (Institute of Acoustics, Chinese Academy of Sciences, P.R. China)

11:30

**Signal Subspace Change Detection in Structured Covariance Matrices**

Rayen Ben Abdallah (Laboratoire Energetique Mecanique et Electromagnetisme, University Paris Nanterre, France); Arnaud Breloy (University Paris Nanterre, France); Abigael Taylor (ONERA, the French Aerospace Lab, France); Mohammed Nabil El Korso (Paris 10 University & LEME-EA 4416, France); David Lautru Lautru (University Paris Nanterre, Laboratoire LEME, France)

11:50

**Feature LMS Algorithm for Bandpass System Models**

Paulo Diniz (Universidade Federal do Rio de Janeiro, Brazil); Hamed Yazdanpanah (University of São Paulo, Brazil); Markus V. S. Lima (Universidade Federal do Rio de Janeiro, Brazil)

**POSTER AREA 1****TMTSP PV: Statistical signal processing**

Chair: Jordi Vilà-Valls  
(ISAE-SUPAERO, University of Toulouse, France)

A1.1

**A Novel Particle Filter for High-Dimensional Systems Using Penalized Perturbations**

Yousef H El-Laham (Stony Brook University (SUNY at Stony Brook), USA); Zahraa N Krayem, Jessica Maghakian and Monica F. Bugallo (Stony Brook University, USA)

A1.2

**Gauss-Hermite Quadrature for non-Gaussian Inference via an Importance Sampling Interpretation**

Víctor Elvira (IMT Lille Douai, France); Pau Closas (Northeastern University, USA); Luca Martino (University of Helsinki, Finland)

A1.3

**A Dyadic Particle Filter for Price Prediction**

Myrsini Ntemi and Constantine Kotropoulos (Aristotle University of Thessaloniki, Greece)  
Complexity-Reduced Suboptimal Equalization with Monte Carlo Based MIMO Detectors  
Guilherme Fernandes (Instituto Tecnológico de Aeronautica & Embraer S.A., Brazil);  
Marcelo Bruno (ITA, Brazil)

- A1.4** **A Data Augmentation Approach for Sampling Gaussian Models in High Dimension**  
Yosra Marnissi and Dany Abboud (SAFRAN TECH, Groupe Safran, France); Emilie Chouzenoux and Jean-Christophe Pesquet (CentraleSupélec, University Paris-Saclay, France); Mohamed ElBadaoui (University of Jean Monet, France); Amel Benazza (Carthage University, Tunisia)
- A1.5** **Structure Learning via Hadamard Product of Correlation and Partial Correlation Matrices**  
Karina Ashurbekova (University Grenoble Alpes, France); Sophie Achard (GIPSA-lab, CNRS, France); Florence Forbes (INRIA Rhône-Alpes, France)
- A1.6** **Low-rank Data Matrix Recovery with Missing Values and Faulty Sensors**  
Roberto López-Valcarce (Universidad de Vigo, Spain); Josep Sala-Alvarez (Universitat Politècnica de Catalunya, Spain)
- A1.7** **Fully Adaptive Savitzky-Golay Type Smoothers**  
Maciej Niedźwiecki and Marcin Ciolek (Gdansk University of Technology, Poland)
- A1.8** **Recursive LCMVEs with Non-Stationary Constraints and Partially Coherent Signal Sources**  
Eric Chaumette (ISAE, France); Jordi Vilà-Valls (ISAE-SUPAERO, University of Toulouse, France); François Vincent (ISAE, France); Pau Closas (Northeastern University, USA)
- A1.9** **On Adaptive Spectrum Estimation of Multivariate Autoregressive Locally Stationary Processes**  
Michał Meller, Maciej Niedźwiecki and Damian Chojnacki (Gdansk University of Technology, Poland)

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## POSTER AREA 2

### SS7: Signal processing methods for 4D arrays

Organizers: Paolo Rocca, Roberto Maneiro-Catoria

Chairs: Roberto Maneiro-Catoria (University of A Coruña, Spain),

Lorenzo Poli (ELEDIA Research Center, University of Trento, Italy)

- A2.1** **MIMO Receiver with Reduced Number of RF Chains Based on 4D Array and Software Defined Radio**  
Grzegorz Bogdan, Konrad Godziszewski and Yevhen Yashchysyn (Warsaw University of Technology, Poland)
- A2.2** **Adaptive Beamforming Based on Time Modulated Array with Harmonic Characteristic Analysis**  
Chong He (Shanghai Jiao Tong University, P.R. China); Guanli Yi (China Shipbuilding Industry Corp., P.R. China); Jingfeng Chen (Shanghai Jiao Tong University, P.R. China)
- A2.3** **Precise Response Control of Transmit-receive Two-dimensional Beampattern in FDA-MIMO Radar**  
Lan Lan, Jingwei Xu and Guisheng Liao (Xidian University, P.R. China); Yuhong Zhang (Xidian University, P. R. China); Yan Huang (Southeast University, Nanjing, P.R. China)

- A2.4** **Beam-Steering in Switched 4D Arrays Based on the Discrete Walsh Transform**  
Roberto Maneiro-Catoira, Marc Bernice Angoue Avele, Julio C. Brégains, José A. García-Naya and Luis Castedo (University of A Coruña, Spain)
- A2.5** **FDA-MIMO Signal Processing for Mainlobe Jammer Suppression**  
Wen-Qin Wang (University of Electronic Science and Technology of China, P.R. China); Hing Cheung So (City University of Hong Kong, Hong Kong); Alfonso Farina (Leonardo Company Consultant, Italy)
- A2.6** **Optimization-based Synthesis of Time-Modulated Arrays with Accurate Time-Frequency Analysis**  
Lorenzo Poli (ELEDIA Research Center, University of Trento, Italy); Marco Salucci (ELEDIA Research Center, Italy); Diego Masotti (University of Bologna, Italy); Paolo Rocca (University of Trento, Italy)
- A2.7** **Time Modulated Array - a Database Approach**  
Israel David Hinostraza Saenz (CentraleSupélec & SONDRRA, France)

## SATELLITE WORKSHOPS

**10:30 - 13:00**

ROOM 4

**SW1L: II XoveTIC Conference.  
Scientific talent at Galicia (Lectures)**  
EUSIPCO 2019 Satellite Workshop

**13:30 - 19:00**

ROOM 4

**SW2: Satellite Workshop on Signal Processing Computer vision and Deep Learning for Autonomous Systems**  
EUSIPCO 2019 Satellite Workshop  
Workshop organizers: Nikos Nikolaidis and Anastasios Tefas (Aristotle University of Thessaloniki, Greece)

**14:00 - 15:30**

POSTER AREA 1, 2

**SW1P: II XoveTIC Conference. Scientific talent at Galicia (Posters)**







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