The 10th IEEE International Workshop on Signal Processing Advances in Wireless Communications

June 21-24, 2009, Perugia, Italy



SPAWC 2009

CONFERENCE PROGRAM





Signal Processing Society

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WELCOME FROM THE GENERAL CO-CHAIRS

It is our great pleasure to welcome you to SPAWC 2009 in Perugia, Italy. As in previous years, this workshop features poster presentations and invited plenaries on recent advances in signal processing for wireless communications, as well as for communications and networking in general.

The workshop is being held in Perugia, roughly in the center of Italy, in the region of Umbria, known as the "green heart of Italy". The historical center of Perugia, in its entirety, is a splendid epitome of arts and civility in Italy. It combines scenic beauties with both medieval and modern architectural interests. There are several important museums such as the Archaeological Museum and the National Gallery, with a collection of Umbrian and Tuscany paintings from the Middle Ages to the Renaissance and considered as one of the most important and richest in Italy. There is also a wealth of artistic beauties inside the city like the "Piazza IV Novembre" (the heart of Perugia), the "Palazzo dei Priori", the "Corso Vannucci", the "Arco Etrusco", the "San Lorenzo" Cathedral, the "San Pietro" Church, the "Rocca Paolina", and the "Collegio del Cambio". Outside the city, neighboring towns like Assisi, Siena, Orvieto, Gubbio, Todi, Spello, and Spoleto, as well as the Trasimeno lake, promise to make the venue attractive for accompanying people and families.

In order to let the attendees fully appreciate and enjoy the historical atmosphere that pervades the city, the workshop itself is held in close-by locations, located in the center of the medieval city. The poster sessions are located in the Rocca Paolina, a fortress built in the middle of the XVI century. The plenary talks are held in the Pavone Theater, which dates back to the beginning of the XVII century, and in the Sala dei Notari, built at the end of the XIII century. A gala banquet will take place Monday evening in the old Rosciano Castle (VI century), while Tuesday afternoon will feature a special tour of the Basilica of San Francesco d'Assisi in Assisi (XII century).

Perugia is a great place for a small, intimate workshop like SPAWC 2009, also because during the summer there are many open bars, restaurants, pubs, and other activities all around which guarantee a pleasant stay in a city with a great cultural and international atmosphere, due to the presence of its old university founded in 1308 and to the Italian University for Foreigners, which attracts thousands of students every year from all over the world.

We sincerely hope that you will enjoy SPAWC 2009, and experience Perugia and all the wonderful highlights it offers!

Ciao! Paolo Banelli Geert Leus Robert W. Heath Jr.

MESSAGE FROM THE TECHNICAL CO-CHAIRS

On behalf of the Technical Program Committee, it is our pleasure to welcome you to SPAWC 2009. We hope you will enjoy the excellent technical program that we have put together.

SPAWC 2009 will focus on emerging topics in the field of signal processing for communications and networking. We have put together a team of world-renowned plenary speakers that will provide insight into new directions for our field. Milica Stojanovic from the Northeastern University is one of the pioneers in underwater communications. She will introduce us to underwater communication and share new signal processing challenges in this area. Bhaskar Rao from the University of California at San Diego is a signal processing expert with a diverse background in various applications. He will review the hot topic of sparse signal recovery and will discuss several applications in communications and related areas. Bertrand Hochwald from Beceem Communications is an expert is the field of multiple-input multiple-output (MIMO) communications. Based on his practical experience building a MIMO-based WiMax system, he will reveal the challenges in building a real MIMO system. Sergio Barbarossa from the University of Rome "La Sapienza" is an expert in signal processing for networking, especially sensor networks. He will discuss distributed and decentralized detection and estimation problems, as applied to wireless sensor networks. Leandros Tassiulas from the University of Thessaly is an expert in ad-hoc networks. He will show us how signal processing is entering the field of networking.

We are very thankful to the plenary speakers for accepting our invitation. We are certain that the plenary talks will motivate many attendees to explore new areas in the field of signal processing for communications and networking.

For the regular program, we received 269 submissions from which 146 were accepted after the review process. The majority of the papers received three reviews. We would like to thank sincerely the members of the technical program committee for their time spent reviewing papers. It is thanks to them that we have been able to put together this high-quality technical program for SPAWC 2009.

Of course, SPAWC 2009 would not exist without the authors. We would like to thank all the authors for their excellent contributions and for their participation in SPAWC 2009.

Finally, do not forget to enjoy the outstanding Medieval setting of this event as well as the superb social events, which the local organizers have selected for us. We hope that SPAWC 2009 in Perugia will be a great success.

Geert Leus Robert W. Heath Jr.

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CONFERENCE SCHEDULE

Sunday, June 21st

17:00 - 20:30	Registration	Hotel Brufani
18:30 - 21:30	Welcome Reception	Hotel Brufani

Monday, June 22nd

8:30 - 13:00 14:00 - 18:30	Registration	Hotel Brufani		
10:00 - 10:15	Welcome Message	Teatro del Pavone		
10:15 - 11:15	Plenary Talk 1: Milica Stojanovic Signal Processing for Underwater Communications	Teatro del Pavone		
	Location Commute			
11:30 - 12:30	Poster Session 1 - Communication over Time-Varying Channels - Distributed Detection and Estimation	Rocca Paolina		
Lunch Break				
14:00 - 15:00	Plenary Talk 2: Bhaskar Rao Sparse Signal Recovery: Theory, Applications and Algorithms	Teatro del Pavone		
Location Commute				
15:15 - 16:15	Poster Session 2 - Multiuser MIMO Systems and Scheduling I - Cognitive Radio	Rocca Paolina		
16:15 - 16:30	Coffee Break	Rocca Paolina		
16:30 - 17:30	Poster Session 3 - Channel Estimation and Equalization - Multiuser MIMO Systems and Scheduling II	Rocca Paolina		
17:00 - 18:00	NSF Session	Teatro del Pavone		
19:15	Bus to the Gala Dinner	Piazza Italia		
20:00	Gala Dinner	Castello di Rosciano		

CONFERENCE SCHEDULE

Tuesday, June 23rd

8:30 - 13:00 14:00 - 16:30	Registration	Hotel Brufani		
9:00 - 10:00	Plenary Talk 3: Bertrand Hochwald What Have We Learned so far about MIMO in Mobile Systems?	Teatro del Pavone		
Location Commute				
10:15 - 11:15	Poster Session 4 - Relay Communication I - Space-Time Coding and Diversity	Rocca Paolina		
11:15 - 11:30	Coffee Break	Rocca Paolina		
11:30 - 12:30	Poster Session 5 - MIMO Communication and Precoding - Multi-hop Networking	Rocca Paolina		
Lunch Break				
14:00 - 15:00	Plenary Talk 4: Sergio Barbarossa Distributed Decision Techniques in Wireless Sensor Networks	Teatro del Pavone		
Free Time				
16:00	Bus to Assisi	Piazza Italia		
16:30 - 19:00	Assisi Tour	Assisi		
19:15	1st Bus to Perugia	Assisi		
21:15	2nd Bus to Perugia	Assisi		
22:00 - 23:30	Jazz Performance	Teatro del Pavone		

CONFERENCE SCHEDULE

Wednesday, June 24th

8:30 - 13:00	Registration	Hotel Brufani		
9:00 - 10:00	Plenary Talk 5: Leandros Tassiulas Ad-hoc wireless networks	Sala dei Notari		
Location Commute				
10:15 - 11:15	Poster Session 6 - Peak Power Reduction, Transmitter Leakage, and ADC's - Relay Communication II	Rocca Paolina		
11:15 - 11:30	Coffee Break	Rocca Paolina		
11:30 - 12:30	Poster Session 7 - Cooperative Communications - Radar, Ranging, Localization, and Beamforming	Rocca Paolina		
Lunch Break				
14:00 - 15:00	Poster Session 8 - Time and Frequency Synchronization - The Interference Channel and Mitigating Interference	Rocca Paolina		
15:00 - 15:15	Coffee Break	Rocca Paolina		
15:15 - 16:15	Poster Session 9 - Error Control Coding and Source Coding - Spread Spectrum and Ultra Wideband Communications	Rocca Paolina		

Signal Processing for Underwater Communications Milica Stojanovic Northeastern University

Monday, June 22nd, 10:15 - 11:15, Teatro del Pavone

Abstract

Wireless information transmission through the ocean is one of the enabling technologies for the development of future ocean-observation systems, whose applications range from oil industry to aquaculture and include gathering of oceanographic data, pollution control, climate recording, prediction of natural disturbances, detection of objects on the ocean floor, and transmission of images from remote sites. Implicitly, wireless signal transmission is crucial for control of autonomous underwater vehicles which will serve as mobile nodes in the future information networks of distributed underwater sensors. The ability to communicate wirelessly provides advantages of collecting data without the need to retrieve the instruments, and maneuvering underwater vehicles and robots without the burden of cables.

Underwater wireless communications are usually established using acoustic waves, since electro-magnetic waves propagate only over very short distances. Acoustic communications are governed by three factors: limited, distance-dependent bandwidth; time-varying multipath propagation, and low speed of sound. Together, these constraints result in a communication channel of poor quality and high latency, thus combining the worst aspects of terrestrial mobile and satellite radio channels into a communication medium of extreme difficulty. Moreover, because the acoustic path loss increases with frequency, signals are confined to the low end of the spectrum, where their bandwidth is not negligible with respect to the center frequency. To achieve high information throughput on such channels, phase and amplitude modulation/detection techniques must be considered because of their bandwidth efficiency. Signal processing methods for bandwidth-efficient underwater communications are based on adaptive channel tracking, equalization, and multichannel combining. These methods have been a topic of extensive research over the past decade, resulting in the development of first high-speed underwater acoustic modems. Today, research is active on the design of communication algorithms that will enable improved performance and lower processing complexity, as well as protocols that will enable integration of point-to-point links into autonomous underwater networks.

In this presentation, we overview the channel characteristics, and outline the signal processing methods for state-of-the-art underwater acoustic communications. The performance of various techniques is discussed through a series of experimental results, which include transmission over distances ranging from a few kilometers in shallow water to hundreds of kilometers in deep water, at highest bit-rates demonstrated to date. We conclude with an outline of open research problems.

Biography



Milica Stojanovic graduated from the University of Belgrade, Serbia, in 1988, and received the M.S. and Ph.D. degrees in electrical engineering from Northeastern University, Boston, MA, in 1991 and 1993. After a number of years with the Massachusetts Institute of Technology, where she was a Principal Scientist, she joined the faculty of Electrical and Computer Engineering Department at Northeastern University in 2008. She is also a Guest Investigator at the Woods Hole Oceanographic Institution, and a Visiting Scientist at MIT. Her research interests include digital communications theory.

statistical signal processing and wireless networks, and their applications to mobile radio and underwater acoustic communication systems. Milica is an Associate Editor for the IEEE Journal of Oceanic Engineering and the IEEE Transactions on Signal Processing.

Sparse Signal Recovery: Theory, Applications and Algorithms Bhaskar Rao University of California at San Diego

Monday, June 22nd, 14:00 - 15:00, Teatro del Pavone

Abstract

The problem of sparse signal recovery has received much attention recently with the development of compressed sensing. The underlying principles have general applicability and provide new and valuable tools to the practicing signal processing engineer. In this talk, we provide an overview of sparseness constraint in signal processing. It has many potential signal processing applications such as efficient signal representation, sparse channel estimation and MEG/EEG analysis, among others which serve to motivate this area. This talk will address the challenges underlying the sparse signal recovery problem, namely the problem of computing the sparsest solution to an undetermined linear system of equations. Unfortunately, the associated optimization problem is computationally complex (NP-hard) motivating the search for suboptimal algorithms, which offer a reasonable compromise between complexity and performance. In particular we will discuss two classes of methods: One based on minimizing diversity measures such as the FOCUSS algorithm and 11 minimization and the other based on sparse Bayesian learning (SBL). In addition to discussing the computational algorithms, we will examine theoretical challenges such as the ability of the algorithms to identify the true sparse solution.

Biography



Bhaskar D. Rao received the B.Tech. degree in electronics and electrical communication engineering from the Indian Institute of Technology, Kharagpur, India, in 1979 and the M.S. and Ph.D. degrees from the University of Southern California, Los Angeles, in 1981 and 1983, respectively. Since 1983, he has been with the University of California at San Diego, La Jolla, where he is currently a Professor with the Electrical and Computer Engineering Department and holder of the Ericsson endowed chair in wireless access networks. His interests are in the areas of digital signal processing, estimation theory, and

optimization theory, with applications to digital communications, speech signal processing, and humancomputer interactions.

His paper received the best paper award at the 2000 speech coding workshop and his students have received student paper awards at both the 2005 and 2006 International conference on Acoustics, Speech and Signal Processing conference as well as the best student paper award at NIPS 2006. A paper he co-authored with B. Song and R. Cruz received the 2008 Stephen O. Rice Prize Paper Award in the Field of Communications Systems. He also received the graduate teaching award from the graduate students in the Electrical Engineering department at UCSD in 1998. He was elected to the fellow grade in 2000 for his contributions in high resolution spectral estimation. Dr. Rao has been a member of the Statistical Signal and Array Processing technical committee, the Signal Processing Theory and Methods technical committee as well as the Communications technical committee of the IEEE Signal Processing Society. He currently serves on the editorial board of the EURASIP Signal Processing Journal.

What Have We Learned so far about MIMO in Mobile Systems? Bertrand Hochwald Beceem Communications

Tuesday, June 23rd, 9:00 - 10:00, Teatro del Pavone

Abstract

Fourth-generation mobile wireless multiuser systems such as WiMax are now being deployed with multiple-antennas at both the transmitter and receiver. These multiple-input-multiple-output (MIMO) deployments are modest in the number of antennas, typically two at the basestation and two at the mobile. We have had some time now to evaluate the effectiveness of MIMO in live mobile networks, and what have we learned? Once MIMO is enabled it is rarely turned off again. It "sells well" and performs even better. The promise of high spectral efficiencies often dominates MIMO discussions, but there are other perhaps less-obvious reasons why MIMO is is being welcomed. I will discuss what we have learned so far using field data from our deployments, and speculate on the role of MIMO in systems to come.

Biography



Bertrand Hochwald was born in New York, NY. He received his undergraduate education from Swarthmore College, Swarthmore, PA and the M.S. in electrical engineering from Duke University, Durham, NC. From 1986 to 1989 he worked for the Department of Defense at Fort Meade, MD. In 1989 he enrolled at Yale University, New Haven, CT, where he received the M.A. in statistics and the Ph.D. in electrical engineering. In 1995-1996 he was a research associate at the Coordinated Science Laboratory, University of Illinois, Urbana-Champaign. He joined the Mathematics of Communications Research

Department at Lucent Technologies Bell Laboratories in September 1996, where he became a Distinguished Member of the Technical Staff in 2002. He is now with Beceem Communications as their Chief Scientist.

He is the recipient of several achievement awards while employed at the Department of Defense and the Prize Teaching Fellowship at Yale. He has served as an editor for several IEEE journals and given plenary and invited talks on various aspects of signal processing and communications. He has several patents in the field of wireless communication, and was a co-recipient of the 2006 Stephen O. Rice paper award from the IEEE Transactions on Communications.

<u>Distributed Decision Techniques in Wireless Sensor Networks</u> Sergio Barbarossa *University of Rome "La Sapienza"*

Tuesday, June 23rd, 14:00 - 15:00, Teatro del Pavone

Abstract

A clear trend in modern networked sensing or communication systems is the search for decentralized strategies endowing the system with the capability of taking autonomous decisions without the intervention of a central control node. Decentralizing decisions improve the resilience of the system with respect to node failure or congestions around the sink nodes. Two important motivating applications, specifically addressed in this talk, are wireless sensor networks and cognitive radio ad hoc networks. In these contexts, the word decision encompasses problems as diverse as cooperative sensing, detection and parameter estimation, communication protocols, motion coordination, network topology control, etc. The goal of this talk is to show how the previous problems can be solved in a decentralized form, with minimum exchange of information between neighboring nodes only. It will be shown, for example, how basic signal processing tools, like signal subspace projection techniques, can be put in a decentralized form, taking into account at the same time the reliability of the decisions, the network topology and the energy necessary for the whole network to reach the final decision, with the prescribed accuracy. The main theme of the talk is to show that, even though the results are only preliminary, a proper cross-fertilization between basic methodological tools such as game theory, complex graphs, and signal processing can provide a really added value in devising innovative autonomous decision strategies, directly put in a decentralized form. The goal is to emphasize the role of interdisciplinary approaches in the design of complex systems, with the hope of triggering the interest of young researchers towards a multidisciplinary approach to build their cultural background as well as to achieve further research developments.

Biography



Sergio Barbarossa received the electrical engineering degree in 1984 and the Ph.D. degree in electrical engineering in 1988, both from the University of Rome "La Sapienza," Rome, Italy. He joined the Radar System Division of Selenia in 1985, as a Radar System Designer. In 1987, he was a Research Engineer at the Environmental Research Institute of Michigan (ERIM), Ann Arbor, MI. From 1988 until 1991, he was an Assistant Professor at the University of Perugia. In November 1991, he joined the University of Rome "La Sapienza," where he is currently a Full Professor and Director of graduate studies. He has

held positions as Visiting Scientist and Visiting Professor at the University of Virginia (1995, 1997), the University of Minnesota (1999), and the Polytechnic University of Catalonia (2001, 2008). He has been one of the primary investigators in several EU projects on multiantenna systems, sensor networks and cognitive radios.

From 1998 to 2004, he has been a member of the IEEE Signal Processing for Communications Technical Committee. He served as an Associate Editor of the IEEE Transactions on Signal Processing from 1998 to 2001 and from 2004 to 2006. He received the 2000 IEEE Best Paper Award from the IEEE Signal Processing Society, for a co-authored paper in the area of signal processing for communications. He is the author of a research monograph on Multiantenna Wireless Communication Systems. His current research interests lie in the areas of cognitive radios and sensor networks.

Ad-Hoc Wireless Networks Leandros Tassiulas University of Thessaly

Wednesday, June 24th, 9:00 - 10:00, Sala dei Notari

Abstract

Wireless technology advances over the last few years lead to sophisticated physical layer designs that may interact with the access and network layer in multiple modes. Link quality related information is passed from the physical layer, to be used in access and network layer actions. At the same time several considerations belonging naturally to the physical layer, like channel coding rate, signal constellation selection, power level adjustments, frequency selection and beam steering in multiple antenna systems are to the disposal of the access layer, that may control them in various time scales. That interaction is particularly useful for full exploitation of the volatile error-prone mobile channel and the establishment of reliable broadband wireless links in the interference limited radio medium. It is clear that novel approaches are needed for architecting networks that seamlessly integrate wired and wireless components and offer the grade of service people are accustomed from the internet. In this presentation we will review a number of theoretical advances towards characterizing the capacity of wireless networks and present an optimization based framework for developing algorithms towards achieving that capacity. The necessary interaction among the different network layers will be discussed while implementation challenges both in terms of computational complexity as well as state information availability will be presented. Implications on the scaling properties of those algorithms and the associated network capacity will be given.

Biography



The speaker is Professor in the Dept. of Computer and Telecommunications Eng., University of Thessaly, since 2002. He held positions as Assistant Professor at Polytechnic University New York (1991-95), Assistant and Associate Professor University of Maryland College Park (1995-2001) and Professor University of Ioannina Greece (1999-2001). His research interests are in the field of computer and communication networks with emphasis on fundamental mathematical models, architectures and protocols of wireless systems, sensor networks, high-speed internet and

satellite communications. He holds a Diploma in Electrical Engineering from the Aristotle University of Thessaloniki, Greece in 1987, and the M.S. and Ph.D. degrees from the University of Maryland, College Park in 1989 and 1991 respectively. Dr. Tassiulas is a Fellow of IEEE. He received a National Science Foundation (NSF) Research Initiation Award in 1992, an NSF CAREER Award in 1995 an Office of Naval Research, Young Investigator Award in 1997 and a Bodosaki Foundation award in 1999. He also received the INFOCOM 1994 best paper award and the INFOCOM 2007 achievement award. His website is http://inf-server.inf.uth.gr/~leandros/.

POSTER SESSION 1: MONDAY, JUNE 22, 11:30 - 12:30

CTC: Communication over Time-Varying Channels

Location: Sala Caminetto (Rocca Paolina)

1) Sequential LSQR-based ICI Equalization and Decision-feedback ISI Cancelation in Pulse-shaped Multicarrier Systems Maria Hammaia (Hainarrith of Vienna, Amstria): Devel Suce (Vienna Hainarrith of

Mario Hampejs (University of Vienna, Austria); Pavol Svac (Vienna University of Technology, Austria); Georg Tauboeck (Vienna University of Technology, Austria); Karlheinz Groechenig (University of Vienna, Austria); Franz Hlawatsch (Vienna University of Technology, Austria); Gerald Matz (Vienna University of Technology, Austria)

2) EM-Based Soft Noncoherent Equalization of Doubly Selective Channels Using Tree Search and Basis Expansion

Sung-Jun Hwang (The Ohio State University, USA); Philip Schniter (The Ohio State University, USA)

- 3) Improved Channel Duration Estimate for Mobile OFDM Systems Stefano Tomasin (University of Padova, Italy); Matteo Butussi (Abilis Systems, Switzerland)
- 4) Multiple Adaptive Frequency Filtering for OFDM Channel Estimation

Marco Rotoloni (University of Padova, Italy); Matteo Butussi (Abilis Systems, Switzerland); Stefano Tomasin (University of Padova, Italy); Mauro Lattuada (Abilis Systems, Switzerland); Christian Ruppert (Abilis Systems, Switzerland)

5) Turbo Equalization for Doubly-Selective MIMO Fading Channels using Exponential Basis Models

Hyosung Kim (Auburn University, USA); Jitendra Tugnait (Auburn University, USA)

6) OFDM Channel Prediction Using Set-Membership Affine Projection Algorithm in Time-Varying Wireless Channel

João Leite (University of Brasília, Brazil); Robson Vieira (INDT, Brazil); Paulo Carvalho (Universidade de Brasilia, Brazil)

7) Diversity Order of Linear Equalizers for Doubly Selective Channels Shakti Shenoy (Institut Eurecom, France); Irfan Ghauri (Infineon Technologies France, France); Dirk Slock (Eurecom, France)

8) Enhanced Turbo MMSE Equalization for MIMO-OFDM over Rapidly Time-Varying Frequency-Selective Channels

Luca Rugini (University of Perugia, Italy); Paolo Banelli (University of Perugia, Italy); Kun Fang (Delft University of Technology, The Netherlands); Geert Leus (Delft University of Technology, The Netherlands)

POSTER SESSION 1: MONDAY, JUNE 22, 11:30 - 12:30

DDE: Distributed Detection and Estimation

Location: Sala Cannoniera (Rocca Paolina)

- Decentralized Asymptotic Detection by Running Consensus
 Paolo Braca (University of Salerno, Italy); Stefano Marano (University of Salerno, Italy); Vincenzo Matta (University of Salerno, Italy); Peter Willett (University of Connecticut, USA)
- 2) Scaling Laws for Distributed Estimation over Orthogonal Fading Channels Habib Senol (Kadir Has University, Turkey); Cihan Tepedelenlioglu (Arizona State University, USA); Kai Bai (Qualcomm Inc., USA)
- 3) Distributed Double Threshold Spatial Detection Algorithms in Wireless Sensor Networks

Stefania Sardellitti (University of Cassino, Italy); Sergio Barbarossa (University of Rome, Italy); Luca Pezzolo (Industry, Italy)

4) A New Distributed Algorithm for Parametric Data Modeling in Wireless Sensor Networks

Nicolas Marechal (CEA LETI, France); Jean-Benoît Pierrot (CEA-Leti, France); Jean-Marie Gorce (INSA-Lyon, France)

5) Distributed Detection over Adaptive Networks based on Diffusion Estimation Schemes

Federico Cattivelli (University of California, Los Angeles, USA); Ali Sayed (University of California, Los Angeles, USA)

6) Clustered Wireless Sensor Networks for Robust Distributed Field Reconstruction based on Hybrid Shift-Invariant Spaces

Günter Reise (Vienna University of Technology, Austria); Gerald Matz (Vienna University of Technology, Austria)

- Channel Aware Sensor Selection in Distributed Detection Systems
 Hamidreza Ahmadi (University of Rochester, USA); Azadeh Vosoughi (University of Rochester, USA)
- 8) Decentralized Detection using Noncoherent Modulation: Is MAC that Good? Christian Berger (University of Connecticut, USA); Marco Guerriero (University of Connecticut, USA); Shengli Zhou (University of Connecticut, USA); Peter Willett (University of Connecticut, USA)
- 9) An SMF Approach to Distributed Average Consensus in Clustered Sensor Networks Amaresh Malipatil (University of Notre Dame, USA); Yih-Fang Huang (University of Notre Dame, USA); Stefan Werner (Helsinki University of Technology, Finland)

POSTER SESSION 2: MONDAY, JUNE 22, 15:15 - 16:15

<u>CR: Cognitive Radio</u>

Location: Sala Cannoniera (Rocca Paolina)

1) Robust Precoding for Orthogonal Space-Time Block Coded MIMO Cognitive Radio Networks

Md Islam (INRS-EMT, University of Quebec, Montreal, Canada); Ying-Chang Liang (Institute for Infocomm Research, Singapore); Rui Zhang (Institute of Infocomm Research, Singapore)

2) Application of Mechanism Design in Opportunistic Scheduling under Cognitive Radio Systems

Jane Huang (University of British Columbia, Canada); Vikram Krishnamurthy (University of British Columbia, Canada)

3) Wideband Spectrum Sensing in Cognitive Radio: Joint Estimation of Noise Variance and Multiple Signal Levels

Roberto López Valcarce (Universidad de Vigo, Spain); Gonzalo Vazquez-Vilar (University of Vigo, Spain)

4) A Nonparametric Sequential Kolmogorov-Smirnov Test for Transmit Opportunity Detection at the MAC Layer

Nikhil Kundargi (University of Minnesota, Twin Cities, USA); Ahmed Tewfik (Univ. of Minnesota, USA)

5) Optimization in Distributed Cooperative Spectrum Sensing for Cognitive Radio

Tao Cui (California Institut of Technology, USA); Feifei Gao (Jacobs University, Bremen, Germany); Nallanathan Arumugam (King's College London, United Kingdom)

- 6) Outage Margin and Power Constraints in Cognitive Radio with Multiple Antennas Petar Popovski (Aalborg University, Denmark); Zoran Utkovski (University of Ulm, Germany); Rocco Di Taranto (Aalborg University, Denmark)
- 7) Cooperative Sensing for Cognitive Radio using Decentralized Projection Algorithms Sergio Barbarossa (University of Rome, Italy); Gesualdo Scutari (University of Rome "La Sapienza", Italy); Timothy Battisti (University of Rome "La Sapienza", Italy)

8) Cooperative Spectrum Sensing via Sequential Detection for Cognitive Radio Networks

Qiyue Zou (University of California, Los Angeles, USA); Songfeng Zheng (Missouri State University, USA); Ali Sayed (University of California, Los Angeles, USA)

POSTER SESSION 2: MONDAY, JUNE 22, 15:15 - 16:15

MMS1: Multiuser MIMO Systems and Scheduling I

Location: Sala Caminetto (Rocca Paolina)

- Distributed Resource Allocation in MIMO OFDMA Networks with Statistical CSIT Mylene Pischella (France Telecom R&D, France); Jean-Claude Belfiore (Ecole Nationale Supérieure des Télécommunications, France)
- 2) Binary versus Symbolic Performance Prediction Methods for Iterative MMSE-IC Multiuser MIMO Joint Decoding

Raphael Visoz (Orange Labs, France); Massinissa Lalam (Orange Labs, France); Antoine Berthet (Supélec, France)

- 3) Robust Joint Precoder/Receive Filter Designs for Multiuser MIMO Downlink P. Ubaidulla (Indian Institute of Science, India); A. Chockalingam (Indian Institute of Science, India)
- 4) Capacity Analysis of Downlink MIMO-OFDMA Frequency Allocation with Imperfect Feedback Information

Jouko Leinonen (University of Oulu, Centre for Wireless Communications (CWC), Finland); Jyri Hämäläinen (Helsinki University of Technology, Finland); Markku Juntti (University of Oulu, Finland)

5) Outage Capacity Analysis of Resource Allocation in Downlink MIMO-OFDMA Systems with the Best-M Feedback Method

Jouko Leinonen (University of Oulu, Centre for Wireless Communications (CWC), Finland); Jyri Hämäläinen (Helsinki University of Technology, Finland); Markku Juntti (University of Oulu, Finland)

6) Unitary Beamforming under Constant Modulus Constraint in MIMO Broadcast Channels

Sebastian Wagner (Eurecom, France); Stefania Sesia (ST-NXP Wireless, France); Dirk Slock (Eurecom, France)

7) Multicell Zero-Forcing and User Scheduling on the Downlink of a Linear Cell-Array Hans Bang (University of Oslo, Norway)

POSTER SESSION 3: MONDAY, JUNE 22, 16:30 - 17:30

CEE: Channel Estimation and Equalization

Location: Sala Cannoniera (Rocca Paolina)

1) Combining Super Exponential Algorithm with Logic Strings and Second Order Statistics for Blind Channel Estimation

André Fonseca dos Santos (Technische Universitaet Dresden, Germany); Wolfgang Rave (Dresden University of Technology, Germany); Gerhard Fettweis (Technische Universität Dresden, Germany)

- 2) A Maximum Entropy Approach to OFDM Channel Estimation Romain Couillet (Supelec, France); Merouane Debbah (Supelec, France)
- 3) Optimisation of a Clustering Based Criterion For Blind Channel Estimation Michel Terré (CNAM, France); Luc Fety (CNAM, France); Nicolas Paul (CNAM, France)
- 4) Iterative Scattered Pilot Channel Estimation in OFDM/OQAM Chrislin Lélé (CNAM, France); Rodolphe Legouable (France Telecom R&D division, France); Pierre Siohan (France Telecom, France)
- 5) Multistage Decoding-Aided Channel Estimation and Equalization for DVB-H in Single-Frequency Networks

Mario Poggioni (University of Perugia, Italy); Luca Rugini (University of Perugia, Italy); Paolo Banelli (University of Perugia, Italy)

6) An Enhanced MMSE per Subchannel Equalizer for Highly Frequency Selective Channels for FBMC Systems Aissa Ikhlef (Université Catholique de Louvain, Belgium); Jerome Louveaux (Université

Catholique de Louvain, Belgium)

- 7) Blind Adaptive Channel Estimation for OFDM Systems Rafael Boloix-Tortosa (University of Seville, Spain); Francisco Simois (University of Seville, Spain); Juan José Murillo-Fuentes (Universidad de Sevilla, Spain)
- 8) Sparse Channel Estimation for OFDM: Over-Complete Dictionaries and Super-Resolution

Christian Berger (University of Connecticut, USA); Shengli Zhou (University of Connecticut, USA); Weian Chen (University of Connecticut, USA); Peter Willett (University of Connecticut, USA)

9) Structured Spatio-temporal Sample Covariance Matrix Enhancement with Application to Blind Channel Estimation in Cyclic Prefix systems Samir Omar (Eurecom, France); Dirk Slock (Eurecom, France)

10) CFO Estimation and Correction in a WiMAX-like FBMC System

Tobias Hidalgo Stitz (Tampere University of Technology, Finland); Ari Viholainen (Tampere University of Technology, Finland); Tero Ihalainen (TUT, Finland); Markku Renfors (Tampere University of Technology, Finland)

POSTER SESSION 3: MONDAY, JUNE 22, 16:30 - 17:30

MMS2: Multiuser MIMO Systems and Scheduling II

Location: Sala Caminetto (Rocca Paolina)

1) Reduced Complexity Design for Weighted Harmonic Mean SINR Maximization in the Multiuser MIMO Downlink

Melvin Lim (University of Leeds, United Kingdom); Mounir Ghogho (University of Leeds, United Kingdom); Desmond McLernon (The University of Leeds, United Kingdom)

2) A Limited Feedback SDMA Scheme with Dynamic Multiplexing Order

Yongming Huang (Royal Institute of Technology, Sweden); Yang Luxi (SouthEast University, P.R. China); Mats Bengtsson (Royal Institute of Technology (KTH), Sweden); Björn Ottersten (Royal Institute of Technology, Sweden)

3) Wiener Filter-Based Fixed-Complexity Vector Precoding for the MIMO Downlink Channel

Maitane Barrenechea (Mondragon Unibertsitatea, Spain); Mikel Mendicute (University of Mondragon, Spain); Javier Del Ser (TECNALIA-Telecom, Spain); John Thompson (University of Edinburgh, United Kingdom)

4) Online Kernel Receiver for Multiaccess MIMO Channels

Konstantinos Slavakis (University of Peloponnese, Greece); Pantelis Bouboulis (University of Athens, Greece); Sergios Theodoridis (University of Athens, Greece)

5) A Low-Complexity Joint Power Control and Beamforming Algorithm for the Downlink of Multi-User W-CDMA Coordinated Systems

Carmen Botella (Chalmers University of Technology, Sweden); Fernando Domene (Universidad Politécnica de Valencia, Spain); Gema Piñero (Universidad Politecnica de Valencia, Spain); Tommy Svensson (Chalmers University of Technology, Sweden)

6) Round-Robin Scheduling for Time-Varying Channels with Limited Feedback Claude Simon (Delft University of Technology, The Netherlands); Geert Leus (Delft University of Technology, The Netherlands)

7) Simplified Transmit Covariance Optimization and User Ordering Algorithm for Successive Zero-Forcing Precoding

Shreeram Sigdel (University of Alberta / TRlabs, Canada); Witold Krzymien (University of Alberta / TRLabs, Canada)

8) Delay Performance Optimization for Multiuser Diversity Systems with Bursty-Traffic and Heterogeneous Wireless Links

Jalil Seifali Harsini (University of Tehran, Iran); Farshad Lahouti (University of Tehran, Iran)

POSTER SESSION 4: TUESDAY, JUNE 23, 10:15 - 11:15

RC1: Relay Communication I

Location: Sala Cannoniera (Rocca Paolina)

1) A Codebook-based Precoding for Dual-hop Downlink with MIMO Amplify-and-Forward Relaying

Yongming Huang (Royal Institute of Technology, Sweden); Yang Luxi (SouthEast University, P.R. China); Mats Bengtsson (Royal Institute of Technology (KTH), Sweden); Björn Ottersten (Royal Institute of Technology, Sweden)

2) An SNR Balancing Approach to Two-Way Relaying

Veria Havary-Nassab (University of Toronto, Canada); Shahram Shahbazpanahi (University of Ontario Institute of Technology, Canada); Ali Grami (University of Ontario Institute of Technology, Canada)

3) Piecewise Linear Relaying: Low Complexity Parametric Relaying Majid Nasiri Khormuji (Royal Institute of Technology, Sweden); Mikael Skoglund (Royal Institute of Technology, Sweden)

4) Blind Maximum-Likelihood Detection for Decode-and-forward Randomized Distributed OSTBC

Tsung-Hui Chang (National Tsing Hua University, Taiwan); Wing-Kin Ma (The Chinese University of Hong Kong, Hong Kong); Chao-Yi Kuo (National Tsing Hua University, Taiwan); Chong-Yung Chi (National Tsing Hua University, Taiwan)

5) Joint Layered Source Adaptation and Resource Allocation over Relay Networks Ubolthip Sethakaset (Institute for Infocomm Research, Singapore); Tony Q. S. Quek (Institute for Infocomm Research, Singapore); Sumei Sun (Institute for Infocomm Research, Singapore)

6) Carrier Frequency Offset and Channel Estimation in Space-Time Non-Regenerative Two-Way Relay Network

Lokesh Thiagarajan (Institute for Infocomm Research, Singapore); Sumei Sun (Institute for Infocomm Research, Singapore); Tony Q. S. Quek (Institute for Infocomm Research, Singapore)

7) On the Feasibility of Full-Duplex Relaying in the Presence of Loop Interference Taneli Riihonen (Helsinki University of Technology, Finland); Stefan Werner (Helsinki University of Technology, Finland); Risto Wichman (Helsinki University of Technology, Finland); Eduardo Zacarías (Helsinki University of Technology, Finland)

8) Multiuser Two-Way Relaying Method for Beamforming Systems Jingon Joung (University of California, Los Angeles, USA); Ali Sayed (University of California, Los Angeles, USA)

9) Outage Analysis of Blind Cooperative Diversity Kamel Tourki (Texas A&M at Qatar (TAMUQ), Qatar); Mohamed-Slim Alouini (Texas A&M University at Qatar, Qatar)

POSTER SESSION 4: TUESDAY, JUNE 23, 10:15 - 11:15

STC: Space-Time Coding and Diversity

Location: Sala Caminetto (Rocca Paolina)

1) MIMO Group-Orthogonal Code-Division Multiplex: A Unified Treatment of Diversity in Multicarrier Systems

Guillem Femenias (Universitat de les Illes Balears, Spain); Felip Riera-Palou (University of the Balearic Islands, Spain)

2) Low Complexity Soft Detection for Spatially Multiplexed BICM MIMO OFDM System

Rizwan Ghaffar (Institut Eurecom, France); Raymond Knopp (Institut Eurecom, France)

3) A Pseudo Alamouti Transceiver Design for OFDM/OQAM Modulation with Cyclic Prefix

Hao Lin (France Telecom, France); Chrislin Lélé (CNAM, France); Pierre Siohan (France Telecom, France)

4) Single-Bit Closed-loop Quasi-Orthogonal Space-Time Codes for MIMO Systems

Eduardo Zacarías (Helsinki University of Technology, Finland); Stefan Werner (Helsinki University of Technology, Finland); Risto Wichman (Helsinki University of Technology, Finland); Taneli Riihonen (Helsinki University of Technology, Finland)

5) Bit-Interleaving Diversity for HARQ Transmission over MIMO Frequency-Selective Channels

Abdel-Nasser Assimi (ETIS, CNRS, ENSEA, Univ Cergy-Pontoise, France); Charly Poulliat (ETIS, CNRS, ENSEA, Univ Cergy-Pontoise, France); Inbar Fijalkow (ETIS, CNRS, ENSEA, Univ Cergy-Pontoise, France)

6) A Simple Angular Transmit Diversity Scheme Using a Single RF Frontend for PSK Modulation Schemes

Osama Alrabadi (Athens Information Technology, Greece); Antonis Kalis (Athens Information Technology, Greece); Constantinos Papadias (Athens Information Technology, Greece)

7) Decorrelating Two Signals Using a Three Side-by-Side Antennas

Osama Alrabadi (Athens Information Technology, Greece); Constantinos Papadias (Athens Information Technology, Greece); Antonis Kalis (Athens Information Technology, Greece)

8) Design of the Best Space-Time Trellis Codes based on Coset Partitioning Pierre Viland (IETR, France); Gheorghe Zaharia (IETR-INSA de Rennes, France); Jean-François Hélard (IETR, France)

9) Space-Time Coding for Distributed Detection in Wireless Sensor Networks Azadeh Vosoughi (University of Rochester, USA); Hamidreza Ahmadi (University of Rochester, USA)

POSTER SESSION 5: TUESDAY, JUNE 23, 11:30 - 12:30

MCP: MIMO Communication and Precoding

Location: Sala Caminetto (Rocca Paolina)

1) Optimal Precoding for a Novel RF-MIMO Scheme in Transmit Correlated Rayleigh Channels

Javier Vía (University of Cantabria, Spain); Victor Elvira (University of Cantabria, Spain); Jesus Ibañez (University of Cantabria, Spain); Ignacio Santamaria (University of Cantabria, Spain)

- 2) Differential CQI Optimization for MIMO with Codebook based Precoding Helka-Liina Määttänen (Helsinki University of Technology, Finland); Olav Tirkkonen (Helsinki University of Technology, Finland); Roman Timo (Nokia, Finland)
- 3) Fixed-Rate Power Allocation Strategies for Enhanced Secrecy in MIMO Wiretap Channels

Amitav Mukherjee (University of California at Irvine, USA); Lee Swindlehurst (University of California at Irvine, USA)

4) Symbol Error Outage for Spatial Multiplexing Systems in Rayleigh Fading Channel and Lognormal Shadowing

Philippe Mary (ETIS UMR 8051 CNRS/ENSEA/University of Cergy-Pontoise, France); Mischa Dohler (CTTC, Spain); Jean-Marie Gorce (INSA-Lyon, France); Guillaume Villemaud (Université de Lyon, INRIA, INSA-Lyon, CITI, France)

5) Optimal Resource Allocation in the Downlink/Uplink of Single-User MISO/SIMO Systems with Limited Feedback

Mario Castaneda (Munich University of Technology, Germany); Amine Mezghani (TU Munich, Germany); Josef A. Nossek (Munich University of Technology, Germany)

6) Low Complexity Transmit Antenna Selection with Power Balancing in OFDM Systems

Ki-Hong Park (Korea University, Korea); Young-Chai Ko (Korea University, Korea); Mohamed-Slim Alouini (Texas A&M University at Qatar, Qatar)

7) Sparse Multipath MIMO Channels: Performance Implications Based on Measurement Data

Michail Matthaiou (Munich University of Technology, Germany); Akbar Sayeed (University of Wisconsin-Madison, USA); Josef A. Nossek (Munich University of Technology, Germany)

8) Robust Transmission of 802.11n Physical Packet Headers

Zied Jaoua (LSS/CNRS, SUPELEC, Plateau de Moulon, 91 192 Gif sur Yvette, France, France); Anissa Zergainoh (LSS, Supelec, France); Pierre Duhamel (LSS SUPELEC, France)

9) Reduced Entropy Parameterization of MIMO Channel Matrices for Finite-Rate Feedback

Christian Guthy (Technische Universität München, Germany); Alexander Krebs (Technische Universität München, Germany); Wolfgang Utschick (Technische Universität München, Germany)

POSTER SESSION 5: TUESDAY, JUNE 23, 11:30 - 12:30

MHN: Multi-hop Networking

Location: Sala Cannoniera (Rocca Paolina)

1) Packet Error Rate and Efficiency Closed-form Expressions for Cross-Layer Hybrid ARQ Schemes

Aude Le Duc (THALES Communications / ENST, France); Christophe J. Le Martret (THALES Communications, France); Philippe Ciblat (ENST, France)

2) On the Throughput of Linear Wireless Multi-Hop Networks using Directional Antennas

Lemonia Dritsoula (Athens Information Technology, Greece); Constantinos Papadias (Athens Information Technology, Greece)

3) Joint Flow Control and Physical Resource Allocation in Multi-service Multiuser Downlink OFDMA System

Naveed Ul Hassan (L'École Supérieure d'Électricité, Gif sur Yvette, France); Mohamad Assaad (Supelec, France)

4) Impact of Fading on the Performance of ALOHA and CSMA

Mariam Kaynia (Norwegian University of Science and Technology, Norway); Geir Oien (NTNU, Norway); Nihar Jindal (University of Minnesota, USA)

5) Optimal Distributed Flow Control over Multiple Parallel Wireless Channels

Antoni Morell (Universitat Autonoma de Barcelona (UAB), Spain); José López Vicario (Universitat Autonoma de Barcelona, Spain); Gonzalo Seco Granados (Universitat Autonoma de Barcelona, Spain)

6) How to Use Multiple Antennas in an Ad-Hoc Wireless Network

Rahul Vaze (University of Texas at Austin, USA); Robert Heath (The University of Texas at Austin, USA)

7) Collision Resolution Based on Pulse Shape Diversity

Xin Liu (Drexel University, USA); Samet Oymak (Drexel University, USA); Athina Petropulu (Drexel University, USA); Kapil Dandekar (Drexel University, USA)

8) Self-Adaptive Distributed Power Control for Opportunistic QoS Provision in Wireless Communication Networks

Fabiano Chaves (University of Campinas (UNICAMP), Brazil); João Romano (DSPCom-Unicamp: Digital Signal Processing for Comm. Lab., State University of Campinas, Campinas, Br, Brazil); Mohamed Abbas-Turki (ENS-Cachan, France); Hisham Abou-Kandil (ENS-Cachan, France)

9) Joint Network/Channel Coding for Bandwidth-Efficient Multi-User ARQ Ragnar Thobaben (Royal Institute of Technology, KTH, Sweden)

POSTER SESSION 6: WEDNESDAY, JUNE 24, 10:15 - 11:15

PPR: Peak Power Reduction, Transmitter Leakage, and ADC's

Location: Sala Cannoniera (Rocca Paolina)

1) Real-Time LUT-less Magnitude Modulation for Peak Power Control of Single Carrier RRC Filtered Signals

Marco Gomes (University of Coimbra, Portugal); Vitor Silva (Institute of Telecommunications, Portugal); Francisco Cercas (ISCTE - Instituto Superior das Ciências do Trabalho e da Empresa, Portugal); Martin Tomlinson (University of Plymouth, United Kingdom)

2) Preamble Design for the Digital Compensation of Tx Leakage in Zero-IF Receivers

Andreas Frotzscher (Technische Universität Dresden, Germany); Gerhard Fettweis (Technische Universität Dresden, Germany)

3) An Iterative Algorithm for Finding the Minimum Sampling Frequency for Two Bandpass Signals

Yuan-Pei Lin (National Chiao Tung University, Taiwan); Yi-De Liu (National Chiao Tung University, Taiwan); See-May Phoong (National Taiwan Universityiversity, Taiwan)

4) Joint Constellation Extension and Tone Reservation for PAPR Reduction in Adaptive OFDM Systems

Mark Petermann (University of Bremen, Germany); Dirk Wübben (University of Bremen, Germany); Karl-Dirk Kammeyer (University of Bremen, Germany)

5) PAPR Reduction for OFDM using Kashin's Representation

Jovana Ilic (University of California Davis, USA); Thomas Strohmer (University of California, Davis, USA)

6) An Analogue Overlaying Scheme based on Phase Rotations

Filippo Tosato (Toshiba Research Europe, United Kingdom); Magnus Sandell (Toshiba TRL, United Kingdom)

7) Three Phase Analog-to-Digital Conversion for High-Rate Short-Range Communications

Alireza Seyedi (University of Rochester, USA)

8) Sigma-Delta Interference Canceling ADC's for Antenna Arrays

Vijay Venkateswaran (Technical University, Delft, The Netherlands); Alle Jan van der Veen (Delft University, The Netherlands); Dirk Slock (Eurecom, France)

9) Fundamental Limits to Communications with Analog-to-Digital Conversion at the Receiver

Stefan Krone (TU Dresden, Germany); Gerhard Fettweis (Technische Universitaet Dresden, Germany)

POSTER SESSION 6: WEDNESDAY, JUNE 24, 10:15 - 11:15

RC2: Relay Communication II

Location: Sala Caminetto (Rocca Paolina)

1) On the Design of Pratical Asynchronous Physical Layer Network Coding

Francesco Rossetto (German Aerospace Center (DLR), Germany); Michele Zorzi (Università degli Studi di Padova, Italy)

2) Optimized Mappings for Dimension-Expansion Relaying

Syed Ali Abbas Zaidi (Royal Institute of Technology (KTH), Sweden, Sweden); Majid Nasiri Khormuji (Royal Institute of Technology, Sweden); Sha Yao (Royal Institute of Technology, Sweden); Mikael Skoglund (Royal Institute of Technology, Sweden)

3) Joint Optimization of Multiple MIMO Relays for Multi-point to Multi-point Communication in Wireless Networks

Batu Krishna Chalise (Universitè catholique de Louvain, Belgium); Luc Vandendorpe (University of Louvain, Belgium)

4) On the Throughput Region of Single and Two-Way Multi-Hop Fading Networks with Relay Piggybacking

Fabio Iannello (NJIT, USA); Osvaldo Simeone (New Jersey Institute of Technology, USA)

5) A Novel Selective Relaying Protocol for Wireless Networks

Yupeng Jia (University of Rochester, USA); Azadeh Vosoughi (University of Rochester, USA)

6) A New Power Allocation Scheme for Amplify and Forward Incremental Relaying Foroogh Tabataba (Sharif University of Technology, Iran); Parastoo Sadeghi (The Australian National University, Australia); Mohammad Reza Pakravan (Sharif University of Technology, Iran)

7) Cooperative Relay Communications in Mesh Networks Angel Bravo-Santos (Universidad Carlos III de Madrid, Spain): Petar

Angel Bravo-Santos (Universidad Carlos III de Madrid, Spain); Petar Djuric (State University of New York at Stony Brook, USA)

8) Cross-Layer Link Adaptation Design for Relay Channels with Cooperative ARQ Protocol

Morteza Mardani (University of Tehran, Iran); Jalil Seifali Harsini (University of Tehran, Iran); Farshad Lahouti (University of Tehran, Iran)

POSTER SESSION 7: WEDNESDAY, JUNE 24, 11:30 - 12:30

<u>CC: Cooperative Communications</u>

Location: Sala Cannoniera (Rocca Paolina)

1) Expanding Cell Coverage in Cooperative Base Station Systems by Means of Randomized MIMO-OFDM Coding

Francesco Verde (Università degli Studi di Napoli Federico II, Italy); Donatella Darsena (University of Napoli, Italy); Anna Scaglione (UC Davis, USA)

2) Cooperative Broadcast in Dense Networks with Multiple Sources

Shrut Kirti (Cornell University, USA); Anna Scaglione (UC Davis, USA)

3) Node Selection for Sidelobe Control in Collaborative Beamforming for Wireless Sensor Networks

Mohammed Ahmed (University of Alberta, Canada); Sergiy Vorobyov (University of Alberta, Canada)

4) Receive Knowledge Only Power Allocation for Nonregenerative Cooperative MIMO Communication

Fabien Heliot (University of Surrey, United Kingdom); Mohammad Fazel Falavarjani (University of Surrey, United Kingdom); Reza Hoshyar (University of Surrey, United Kingdom); Rahim Tafazolli (University of Surrey, United Kingdom)

5) A Closed-Form Approximation of the Outage Probability for Distributed MIMO Systems

Fabien Heliot (University of Surrey, United Kingdom); Reza Hoshyar (University of Surrey, United Kingdom); Rahim Tafazolli (University of Surrey, United Kingdom)

6) Linear Network Coordinated Beamforming for Cell-Boundary Users

Chan-Byoung Chae (Harvard University, USA); Sang-hyun Kim (The University of Texas at Austin, USA); Robert Heath (The University of Texas at Austin, USA)

7) Increased Fairness in Cellular Networks through Base Station Cooperation Hans Bang (University of Oslo, Norway)

POSTER SESSION 7: WEDNESDAY, JUNE 24, 11:30 - 12:30

RRL: Radar, Ranging, Localization, and Beamforming

Location: Sala Caminetto (Rocca Paolina)

1) Automatic Robust Adaptive Beamforming Based on Latent Root Regression

Jun Yang (Chinese Academy of Sciences, P.R. China); Xiaochuan Ma (Chinese Academy of Sciences, P.R. China); Chaohuan Hou (Chinese Academy of Sciences, P.R. China); Yicong Liu (Chinese Academy of Sciences, P.R. China)

- 2) Doppler Radar and Postprocessing Techniques for Small Area Surveillance Matthias Wildemeersch (Joint Research Centre, Italy); Julien Petit (Joint Research Centre, Italy); Joaquim Fortuny-Guasch (Joint Research Center, Italy)
- 3) Target Localization in Sensor Networks: Consensus, but not so much Paolo Addesso (University of Salerno, Italy); Stefano Marano (University of Salerno, Italy); Vincenzo Matta (University of Salerno, Italy)
- 4) Adjusting the Generalized Likelihood Ratio Test of Circularity Robust to Non-Normality

Esa Ollila (Helsinki University of Technology, Finland); Visa Koivunen (Helsinki University of Technology, Finland)

- 5) Analysis of the COLD Uniform Linear Array Rémy Boyer (CNRS, Université Paris-Sud (UPS), Supelec, France)
- 6) OFDM Ranging in Multipath Channels Using Time Reversal Method

Azadeh Haghparast (Helsinki University of Technology, Finland); Traian Abrudan (Helsinki University of Technology, Finland); Visa Koivunen (Helsinki University of Technology, Finland)

7) Time-of-Arrival Estimation in Path Attenuation

Bamrung Tau Sieskul (Gottfried Wilhem Leibniz Universität Hannover, Germany); Feng Zheng (Leibniz Universität Hannover, Germany); Thomas Kaiser (Leibniz University of Hannover, Germany)

POSTER SESSION 8: WEDNESDAY, JUNE 24, 14:00 - 15:00

ICM: The Interference Channel and Mitigating Interference

Location: Sala Caminetto (Rocca Paolina)

1) Low SNR Capacity of MIMO Channels with a Single Interferer

Caijun Zhong (University College London, United Kingdom); Shi Jin (University College London, United Kingdom); Kai Kit Wong (University College London, United Kingdom)

2) FM Interference Mitigation in a Finitely Correlated Environment Using a Decorrelating Time-Varying Autoregressive Model

Roshin Kadanna Pally (DSPRL-Wireless@VT, USA); A. A. (Louis) Beex (Virginia Tech, USA)

3) Cognitive Beamforming Made Practical: Effective Interference Channel and Learning-Throughput Tradeoff

Rui Zhang (Institute of Infocomm Research, Singapore); Feifei Gao (Jacobs University, Bremen, Germany); Ying-Chang Liang (Institute for Infocomm Research, Singapore)

4) A Least Squares Approach to Joint Beam Design for Interference Alignment in Multiuser Interference Channels

Heejung Yu (KAIST, Korea); Juho Park (KAIST, Korea); Youngchul Sung (KAIST, Korea); Yong Hoon Lee (KAIST, Korea)

5) Inter-Cell Interference Analysis for OFDM-FBMC Systems

Yahia Medjahdi (Cnam, France); Michel Terré (CNAM, France); Didier Le Ruyet (CNAM, France); Daniel Roviras (Cnam, France); Josef A. Nossek (Munich University of Technology, Germany); Leonardo Baltar (Technische Universität München, Germany)

6) On the Gains of Fixed Relays in Cellular Networks with Intercell Interference

Erhan Yilmaz (Institute Eurecom, France); Raymond Knopp (Institut Eurecom, France); David Gesbert (Eurecom, France)

7) Outage Analysis of Block-Fading Gaussian-Interference-Channels

Yang Weng (University of Illinois at Chicago, USA); Daniela Tuninetti (University of Illinois at Chicago, USA)

POSTER SESSION 8: WEDNESDAY, JUNE 24, 14:00 - 15:00

TFS: Time and Frequency Synchronization

Location: Sala Cannoniera (Rocca Paolina)

- 1) Joint Symbol Timing and CFO Estimation in Multiuser OFDM/OQAM Systems Tilde Fusco (University of Naples, Italy); Angelo Petrella (Università di Napoli Federico II, Italy); Mario Tanda (Università di Napoli Federico II, Italy)
- 2) A Practical Algorithm for CFO Recovery in OFDM-based Cognitive Radio Systems Luca Sanguinetti (University of Pisa, Italy); Michele Morelli (University of Pisa, Italy); Giuseppe Imbarlina (University of Pisa, Italy)
- 3) Clock Jitter Estimation and Suppression in OFDM Systems Employing Bandpass $\Sigma \Delta$ ADC

Bakti Putra (Technische Universität Dresden, Germany); Gerhard Fettweis (Technische Universität Dresden, Germany)

4) Low Complexity IQ Imbalance Estimation in the presence of a Carrier Frequency Offset for OFDM Receivers

Sylvain Traverso (Université de Cergy Pontoise, France); Myriam Ariaudo (ETIS, ENSEA, Université Cergy-Pontoise, CNRS, France); Inbar Fijalkow (ETIS, CNRS, ENSEA, Univ Cergy-Pontoise, France); Jean-Luc Gautier (ECIME / ENSEA - UCP, France)

5) Effective Techniques for Blind Phase Offset Estimation in LDPC Coded Systems Rodrigue Imad (Institut TELECOM; TELECOM Bretagne, France); Sebastien Houcke (Institut TELECOM; TELECOM Bretagne, France); Mounir Ghogho (University of Leeds, United Kingdom)

6) Optimum Metric for Frame Synchronization with Gaussian Noise and Unequally Distributed Data Symbols

Maria Martini (Kingston University, United Kingdom); Marco Chiani (University of Bologna, Italy)

7) Carrier Frequency Offset Estimation in OFDMA Systems Based on Averaging over Successive Blocks

Yupeng Liu (Drexel University, USA); Athina Petropulu (Drexel University, USA)

POSTER SESSION 9: WEDNESDAY, JUNE 24, 15:15 - 16:15

ECC: Error Control Coding and Source Coding

Location: Sala Cannoniera (Rocca Paolina)

1) On Distributed Serially Concatenated Codes

Zhongwei Si (Royal Institute of Technology, Sweden); Ragnar Thobaben (Royal Institute of Technology, KTH, Sweden); Mikael Skoglund (Royal Institute of Technology, Sweden)

2) Rate Enhancement of BICM-OFDM with Adaptive Coding and Modulation via a Bisection Approach

Carsten Bockelmann (University of Bremen, Germany); Dirk Wübben (University of Bremen, Germany); Karl-Dirk Kammeyer (University of Bremen, Germany)

3) Efficient Parity Bit Estimation for Turbo Codes Toni Levanen (Tampere University of Technology, Finland); Markku Renfors (Tampere University of Technology, Finland)

4) Joint Modulation Classification and Multi-User Detection using Multi-Modulation Sphere Decoding

Byonghyo Shim (Korea University, Korea); Insung Kang (Qualcomm Inc., USA)

5) Joint Protocol-Channel Decoding for Robust Agrregated Packet Recovery at WiMAX MAC Layer

Usman Ali (Supelec, France); Michel Kieffer (L2S - CNRS - SUPELEC - Univ Paris-Sud, France); Pierre Duhamel (LSS SUPELEC, France)

6) Optimized Constant-rate Encoding for Decentralized Parameter Estimation with Wireless Sensor Networks

Javier Matamoros (Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Spain); Carles Anton-Haro (Telecommunications Technological Center of Catalonia (CTTC), Spain)

7) MMSE Decoding for Analog Joint Source Channel Coding Using Monte Carlo Importance Sampling

Yichuan Hu (University of Delaware, USA); Javier Garcia-Frias (University of Delaware, USA); Meritxell Lamarca (Technical University of Catalonia, Spain)

8) Optimum Power Allocation and Bit Loading with Code Rate Constraints

David Matas (Technical University of Catalonia (UPC), Spain); Meritxell Lamarca (Technical University of Catalonia, Spain)

POSTER SESSION 9: WEDNESDAY, JUNE 24, 15:15 - 16:15

SSU: Spread Spectrum and Ultra Wideband Communications

Location: Sala Caminetto (Rocca Paolina)

1) Effect of Uncoordinated Network Interference on UWB Energy Detection Receiver

Alberto Rabbachin (Joint Research Centre, European Commission, Italy); Tony Q. S. Quek (Institute for Infocomm Research, Singapore); Ian Oppermann (Nokia Siemens Networks, Finland); Moe Win (Massachusetts Institute of Technology, USA)

2) Sparsity-Aware Estimation of CDMA System Parameters

Daniele Angelosante (University of Cassino, Italy); Emanuele Grossi (Università degli Studi di Cassino, Italy); Georgios B. Giannakis (University of Minnesota,, USA); Marco Lops (University of Cassino, Italy)

3) A Monte-Carlo Implementation of the SAGE Algorithm for Joint Soft Multiuser and Channel Parameter Estimation

Erdal Panayirci (Princeton University, Princeton, USA); Alexander Kocian (University of Rome "Tor Vergata", Italy); Vincent Poor (Princeton University, USA); Marina Ruggieri (University of Roma Tor Vergata, Rome, Italy, Italy)

4) Differentiated Multiuser Resource Allocation Scheme for Multi-band UWB systems

Ayman Khalil (Institute of Electronics and Telecommunications of Rennes - IETR, France); Matthieu Crussière (Electronics and Telecommunications Research Institute of Rennes (IETR/INSA), France); Jean-François Hélard (IETR, France)

5) Novel Graph-Based Algorithms for Interference Cancellation in CDMA Systems Alan Barbieri (Scuola Superiore Sant'Anna, Italy); Giulio Colavolpe (University of Parma, Italy); Dario Fertonani (Arizona State University, Italy); Amina Piemontese (University of Parma, Italy)

6) A Least-Square Unconstrained Frequency-Domain Adaptive Filter Approach for Chip-Level Equalization of DS-CDMA Systems

Cristiano Panazio (University of Sao Paulo, Brazil)

7) System Parameter Selection for Asymmetric Underlay CDMA Networks with Interference-Minimizing Code Assignment

Mohamed Kashef (Cairo University, Egypt); Mohamed Abdallah (Cairo University, Egypt); Ayman Elezabi (American University, Cairo, Egypt); Mohamed Khairy (Cairo University, Egypt)

NSF SESSION

Session Overview

A special session, organized by the National Science Foundation (NSF), will take place on Monday 22nd June, from 17:00 to 18:00, at the Teatro del Pavone. This special session will focus on the NSF Division of Computing and Communication Foundations (CCF), and will also include an overview about funding opportunities and future research directions.

NSF Speakers and Partecipants

The NSF session will be presented by:

- John Cozzens (NSF, CCF Program Director)
- Sampath Kannan (NSF, CCF Division Director)
- William Tranter (NSF, CCF Communications Program Director)

About NSF

The NSF is an independent federal agency created by the USA Congress in 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense..." With an annual budget of about six billion dollars, NSF is the funding source for approximately 20 percent of all federally supported basic research conducted by America's colleges and universities. In many fields such as mathematics, computer science and the social sciences, NSF is the major source of federal backing.

INFORMATION ON SOCIAL PROGRAM

Welcome Reception

The welcome reception will be held at the rooftop terraces of the Hotel Brufani from 18:30 to 21:30 on Sunday 21st June.

Gala Dinner (Conference Banquet)

The gala dinner will be held from 20:00 on Monday 22nd June. It will take place at the Castello di Rosciano (X Century), on the top of a hill 20 km from Perugia. The dinner will be organized with appetizers offered in the garden with a scenic view towards both Assisi and Perugia, and with served dishes in the castle halls.

Buses to the banquet will leave at around 19:15.

Assisi Tour

The Assisi tour will take place on Tuesday 23rd June. The tour will visit the chapel where S. Francis is buried, and where impressive roof-paints of Giotto, Cimabue, and other painters are magnificently preserved.

The bus for this tour will leave at around 16:00.

Jazz Performance

The jazz performance will be held after the Assisi tour, on Tuesday 23rd June. The performance will take place at Teatro del Pavone, and will run from 22:00 to 23:30.

The performance will be delivered by BaseOne, a professional Jazz quartet, which will anticipate the atmosphere of Umbria Jazz, the famous International Jazz festival that takes place every year in July. BaseOne, leaded by Tony Formichella, plays not only pure jazz, but also contaminations from blues, funky, soul and Latin American music.

USEFUL MAPS: <u>Perugia City Center (Conference Places)</u>



USEFUL MAPS: <u>Rocca Paolina</u>





USEFUL MAPS: Perugia City Center (Restaurants and Pharmacies)

Restaurants

- R1 Al Mangiar Bene
- R2 Altromondo
- R3 Caffé di Perugia
- R4 Cesarino
- R5 Da Peppone
- R6 Ferrari
- R7 Il Bacio
- R8 Il Padrino
- R9 Il Segreto di Pulcinella

- R10 La Cambusa
- R11 La Piazzetta
- R12 La Rosetta
- R13 L'Opera
- R14 Osteria del Gambero
- R15 Osteria del Ghiottone
- R16 Pizzeria Mediterranea
- R17 Ristorante del Sole

- <u>Conference Places</u>
- C1 Hotel Brufani
- C2 Sala dei Notari
- C3 Teatro del Pavone
- C4 Rocca Paolina

Pharmacies

- P1 Farmacia Lemmi
- P2 Farmacia San Martino



USEFUL MAPS: Perugia City Center (Monuments and Museums)

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• Office of Naval Research Global (under Grant Number: N62909-09-1-1024)



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