

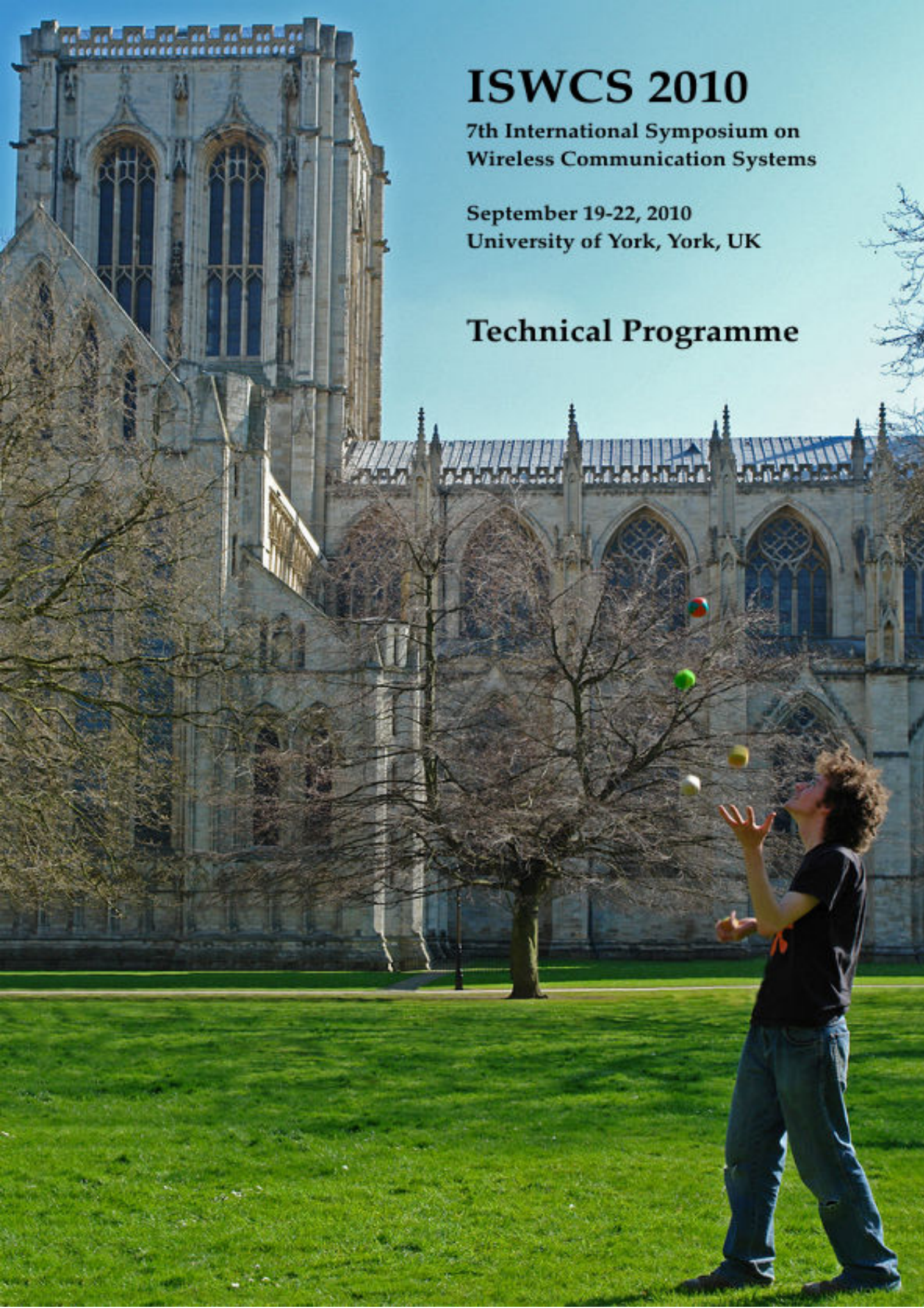
ISWCS 2010

7th International Symposium on
Wireless Communication Systems

September 19-22, 2010

University of York, York, UK

Technical Programme



ISWCS 2010 & WUN COGCOM 2010 Programme Contents

Welcome Message from the General Chairs	3
Welcome Message from the Technical Programme Chairs.....	4
WUN COGCOM 2010 Welcome Message from the Workshop Chairs.....	6
ISWCS 2010 Organising Committee	7
ISWCS 2010 Technical Programme Committee	8
Timetable for ISWCS 2010 & WUN COGCOM 2010	11
ISWCS 2010 Keynotes	15
Do Communication Engineers Need Circuit Circuit Theory?.....	15
Self-organization in Mobile Communication Systems	16
Adaptive Networks and Bio-Inspired Cognition	17
Cooperation in Cellular Networks: Taking a new look at interference	18
High-Throughput Block Transceivers.....	19
ISWCS 2010 Tutorials.....	20
Wireless network coding: the network aware PHY layer	20
Signal waveform design for underwater acoustic communications	21
Energy-Efficient Distributed Signal Processing in Mobile Wireless Sensor Networks	22
Cognitive Radio Access to TV White Spaces: Spectrum Opportunities, Remaining Technology Challenges and Applications.....	23
Adaptive Signal Processing of Noncircular Complex Signals.....	24
Recent advances in Peak to Average Power Ratio reduction methods for multi-carrier systems	25
Detailed Technical Programme for Main Conference.....	26
Detailed Technical Programme for WUN COGCOM 2010 Workshop	43
ISWCS 2010 Visitor Information	45
ISWCS 2010 Events.....	47
ISWCS 2010 & WUN COGCOM 2010 Map	49

ISWCS 2010

The Seventh International Symposium on Wireless Communication Systems

19th – 22nd September 2010

Conference Programme



The University of York, York, United Kingdom

Technical Co-Sponsorship: IEEE Vehicular Technology Society and

IEEE Communications Society



IEEE COMMUNICATIONS SOCIETY

THE UNIVERSITY *of York*

Welcome Message from the General Chairs



Rodrigo C. de Lamare

On behalf of the ISWCS 2010 Organising Committee, it is our great pleasure to welcome you to York, United Kingdom and to the International Symposium on Wireless Communication Systems 2010 (September 19-22, 2010). ISWCS 2010 is the 7th event in the series, following the success of ISWCS'09 in Siena, ISWCS'08 in Reykjavik, ISWCS'07 in Trondheim, ISWCS'06 in Valencia, ISWCS'05 in Siena, and ISWCS'04 in Mauritius.

This year, we are delighted to host the conference for the first time in York, United Kingdom. ISWCS 2010 covers a wide range of topics and technical challenges, in view of the growing interest in wireless communications. The scope of the conference includes communication theory, wireless networking and protocols, signal processing, wireless sensor networks, antennas and propagation, cognitive radio and their applications.



Paul D. Mitchell

ISWCS 2010 is a forum for leading wireless communication researchers and technologists to present new ideas and contributions in the form of technical papers, as well as test-bed implementations and real-world evaluation of ideas in wireless communications. As part of the main ISWCS 2010 event, the workshop on cognitive communications (WUN COGCOM 2010) will be an important opportunity to focus on state-of-the-art research in this vibrant field. A joint exhibition area has been organised with the support of sponsors.

The total number of submissions for the event was 338, based on which a high quality technical programme has been produced. The high number of submissions received indicates that ISWCS is on the right path to greater success in the future. Moreover, ISWCS 2010 has secured technical sponsorship from the IEEE Vehicular Technology Society and of the IEEE Communications Society.

York is a medieval city, rich in history and monuments, and world-renowned for its city walls and museums. We hope you will take advantage of the local hospitality, the city centre, rivers and medieval streets of York, enjoy the conference and your visit to such a beautiful city that attracts visitors and tourists from around the world.

The organisers would like to thank all the members of the organising and steering committee for their constant support and valuable work. A special thanks to all the sponsors for their support. We are very pleased to invite you to attend ISWCS 2010, and looking forward to meeting you in York.

Paul D. Mitchell and Rodrigo C. de Lamare

General Chairs

Department of Electronics

University of York

United Kingdom

Welcome Message from the Technical Programme Chairs

Welcome to the 7th IEEE International Symposium on Wireless Communication Systems 2010 (ISWCS 2010), which will take place in the historic medieval city of York, United Kingdom, from Sunday, September 19th, 2010, until Wednesday, September 22nd, 2010.

The aim of this symposium is to provide a forum to present new ideas and contributions in wireless communications, networking and signal processing to support the needs of the Information Society. The scope of the conference includes a wide range of topics in wireless communications including communication theory, wireless networking and protocols, signal processing, wireless sensor networks, antennas and propagation, cognitive radio and their applications.

We are delighted to have five excellent plenary speakers, Prof. Josef A. Nossek (Munich University of Technology), Prof. Andreas Mitschele-Thiel (Ilmenau University of Technology), Prof. Ali H. Sayed (UCLA), Prof. David Gesbert (Eurecom), Prof. Paulo S. R. Diniz (Federal University of Rio de Janeiro), whose overview presentations will start the programme every morning and early afternoon.

ISWCS 2010 has been organized to provide a high quality programme composed of a highly competitive selection of contributed papers, a very limited set of invited papers on important and timely topics from well-known leaders in the field, and poster sessions that are both informative and interesting for the participants. Moreover, there are a number of special sessions, which have been organised by invited session chairs. This symposium is organised into two parallel tracks:

- Communication Theory, Signal Processing, and Antennas and Propagation
- Networking, Cognitive Radio, and Wireless Sensor Networks.

The programme will start with instructive tutorials on Sunday, September 19th, 2010 that are included in the conference registration fee. In addition to the two tracks, you can participate in a Workshop on Cognitive Communications (WUN COGCOM 2010), which will take place on Wednesday, September 22nd, 2010.

We would like to acknowledge and thank our 217 Technical Programme Committee members for their hard work and dedication in providing detailed reviews and informative discussion within a very tight timeframe. Thanks also to the organising committee and the authors who have submitted a large number of high quality and thought provoking papers, which has resulted in an impressive technical programme that will spark off interesting discussions and promote new areas of research. Our special thanks go to Dr. Rodrigo C. de Lamare and Dr. Paul D. Mitchell, the General Chairs of the conference. Their dedication to the conference set an example for us to follow and made it a pleasure to work with them on such a considerable project.

The response to our call for papers was very positive, thanks to a highly successful publicity phase. This year, we have received 311 submissions for the main conference, 27 submissions for the workshop. We have been able to accept 194 papers in the main conference programme (62% acceptance rate) and 15 in the workshop programme (56% acceptance rate). We additionally have 3 invited papers for the main conference, and 3 invited papers for the workshop. During the closing ceremony on Wednesday, September 22nd, 2010, we plan to present four ISWCS 2010 Best Paper Awards, one for the best paper in each of the two tracks, one for the best paper in the special sessions, and one for the best paper in the Workshop on Cognitive Communications.

It is our great pleasure to welcome you to ISWCS 2010 in York. We hope that you will enjoy the technical programme and that you take advantage of the excellent group of people that have come

together for the symposium. Some of the best opportunities come from the technical discussions and the chance to exchange ideas with other colleagues. We are looking forward to meeting all of you at the Welcome Reception on Sunday, September 19th, 2010 as well as at the symposium itself.



Martin Haardt

Technical Programme Chair
Communications Research Laboratory
Ilmenau University of Technology
Germany



Honggang Zhang

Technical Programme Chair
Zhejiang University
China

WUN COGCOM 2010 Welcome Message from the Workshop Chairs

Welcome to the WUN COGCOM 2010 Workshop, which forms part of the 7th IEEE International Symposium on Wireless Communication Systems (ISWCS 2010) being held in York, UK.

The workshop, organised by the WUN Cognitive Communications Consortium, will showcase work being done within the Consortium, while also providing like-minded non-members a forum to present their latest research. The WUN Cognitive Communications Consortium (<http://www.wun-cogcom.org>) was established in January 2009, and now has members from over 65 academic and industrial organisations worldwide.

Cognitive communications as the application of cognition to wireless systems in the most general sense, is a field which incorporates techniques from several disciplines, including distributed artificial intelligence, electromagnetics, regulatory policy and economics, in addition to wireless communications. Thus, cognitive communications encompasses more than just the standard areas of cognitive radio and cognitive networks, and includes more speculative areas, such as cognitive environments (incorporating frequency selective surfaces), and cognitive acoustics.

This workshop consists of 3 invited papers, and 15 papers selected from 27 peer-reviewed submissions from the open call. Supplementing the technical sessions is a panel session, where the panellists will be addressing 'The role of Embedded Intelligence in Cognitive Communications', which will be of significant importance to future wireless communications networks in the years to come.

This one day public workshop will be followed by a meeting of the WUN Cognitive Communications Consortium, which will take place on Thursday 23rd September at the conference venue. Non-members who would like to join the Consortium and attend the meeting should contact its chair, Dr. David Grace (dg@ohm.york.ac.uk), beforehand.

We hope you enjoy the programme that we have put together, and we look forward to your continued support of future ISWCS and/or WUN Cognitive Communications Consortium activities.



David Grace

University of York, UK
WUN COGCOM 2010 Chair



Honggang Zhang

Zhejiang University, China
WUN COGCOM 2010 Chair



Alexander M. Wyglinski

Worcester Polytechnic Institute, USA
WUN COGCOM 2010 Chair

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- Rodrigo C. de Lamare, University of York, UK.

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- Yuming Jiang, Norwegian University of Science and Technology (NTNU), Norway.

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Panel Chair:

- Tim Tozer, University of York, UK.

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Conference Secretariat:

- Camilla Danese, University of York, UK.

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Timetable for ISWCS 2010 & WUN COGCOM 2010

		9:30-11:00	11:00-11:30	11:30-13:00	13:00-14:00	14:00-15:30	15:30 - 16:00	16:00-17:30	18:00 – 20:00	
Sunday 19th September		Tutorials 1- 3	Coffee Break	Tutorials 1- 3	Lunch	Tutorials 4 - 6	Coffee Break	Tutorials 4 - 6	Welcome Reception	
	8:30 – 9:00	9:00 – 10:00	10:00 – 10:30	10:30 – 12:10 10:00 – 12:10	12:10 - 14:00	14:00 - 15:00	15:00 – 16:40	16:40 - 17:00	17:00 – 18:40	19:30 -
Monday 20th September	Opening Ceremony	Keynote Speech 1	Coffee Break	Technical Session 1 Poster Session 1	Lunch	Keynote Speech 2	Technical Session 2	Coffee Break	Technical Session 3	Tours
Tuesday 21st September		Keynote Speech 3		Technical Session 4 Poster Session 2		Keynote Speech 4	Technical Session 5		Technical Session 6	Banquet
Wednesday 22nd September		Keynote Speech 5		Technical Session 7 Poster Session 3		Panel Session	Technical Session 8		Closing Ceremony	Tours
		Workshop Opening		Dynamic Spectrum Access/Management		Workshop Panel Session	Realisation of Cognitive Radio Networks		Cognitive Multiple Access and Physical Layers	

The registration/information desk will be open from 8.00 until 18.40 from Sunday to Wednesday.

Sunday, 19th September

Time:	Event and Place:		
09:30 – 11:00	Tutorial 1 Prof. Burr/ Prof. Sykora Room: P/L002	Tutorial 2 Prof. Sharif/ Dr. Tsimenidis Room: P/T007	Tutorial 3 Dr. Arienzo Room: P/L001
11:00 – 11:30	Coffee Break – concourse area		
11:30 – 13:00	Tutorial 1 Room: P/L002	Tutorial 2 Room: P/T007	Tutorial 3 Room: P/L001
13:00 – 14:00	Lunch - Roger Kirk Centre		
14:00 – 15:30	Tutorial 4 Dr. Nekovee Room: P/L002	Tutorial 5 Dr. Mandic and Prof. Douglas Room: P/L001	Tutorial 6 Prof. Louet Room: P/T007
15:30 – 16:00	Coffee Break – concourse area		
16:00 – 17:30	Tutorial 4 Room: P/L002	Tutorial 5 Room: P/L001	Tutorial 6 Room: P/T007
18:00 – 20:00	Welcome Reception - Roger Kirk Centre		

Monday, 20th September

8:30 – 9:00	Opening Ceremony Room: P/X001	
9:00 – 10:00	Keynote Speech 1 Prof. Nossek Room: P/X001	
10:00 – 10:30	Coffee Break – concourse area	Poster Session 1 a) Underwater acoustic communications (special session) - concourse area b) Ultra wideband systems (special session) - concourse area c) Transmit processing techniques - concourse area
10:30 – 12:10	Technical Session 1 a) MIMO systems I - P/L002 b) Adaptive and array signal processing – P/T007 c) Wireless sensor networks I – P/L001	
12:10 – 14:00	Lunch- Roger Kirk Centre	
14:00 – 15:00	Keynote Speech 2 Prof. Mitschele-Thiel Room: P/X001	
15:00 – 16:40	Technical Session 2 a) Space-time coding and processing – P/L002 b) Cooperative and multicell beamforming - P/T007 c) Recent advances on implicit/superimposed training for communications (special session) – P/L005 d) Cognitive radio and networking I – P/L001	
16:40 – 17:00	Coffee Break – concourse area	
17:00 – 18:40	Technical Session 3 a) Relaying techniques I – P/L002 b) Precoding and scheduling – P/T007 c) Cellular networks – P/L005 d) Wireless mesh and multi-hop networks – P/L001	
20:00 –	Tours Ghost Walk, Exhibition Square (by the fountains), York	

Tuesday, 21st September

9:00 – 10:00	Keynote Speech 3 Prof. Sayed Room: P/X001	
10:00 – 10:30	Coffee Break – concourse area	
10:30 – 12:10	Technical Session 4 a) MIMO systems II – P/L002 b) Detection and estimation – P/T007 c) Ultra wideband communications – P/L005 d) Wireless sensor networks II – P/L001	Poster Session 2 a) Advances on adaptive signal processing (special session) - concourse area b) Spread spectrum, multicarrier communications and relaying techniques - concourse area
12:10 – 14:00	Lunch- Roger Kirk Centre	
14:00 – 15:00	Keynote Speech 4 Prof. Gesbert Room: P/X001	
15:00 – 16:40	Technical Session 5 a) Relaying techniques II – P/L002 b) Error-control coding – P/T007 c) Underwater acoustic communications (special session) – P/L005 d) Cognitive radio and networking II – P/L001	
16:40 – 17:00	Coffee Break – concourse area	
17:00 – 18:40	Technical Session 6 a) Cooperative communications and interference management – P/L002 b) Antennas and propagation – P/T007 c) Protocols – P/L001 e) Self-organization in mobile communication systems (special session) – P/L005	
19:30 –	Banquet Gala Dinner at the National Railway Museum, Leeman Road, York, YO26 4XJ, Tel: +44 (0)8448 153139	

Wednesday, 22nd September

ISWCS Main Conference		WUN COGCOM
09:00 – 10:00	Keynote Speech 5 Prof. Diniz Room: P/X001	Workshop Opening P/L005
10:00 – 10:30	Coffee Break – concourse area	Coffee Break – concourse area
10:30 – 12:10	Technical Session 7 <ul style="list-style-type: none"> a) Error-control coding and iterative processing – P/L002 b) Short range communications and sensor networks – P/T007 c) Wireless sensor networks III – P/L001 	Poster Session 3 <ul style="list-style-type: none"> a) Wireless systems, theory and applications – concourse area b) Wireless networks and applications – concourse area
12:10 – 14:00	Lunch- Roger Kirk Centre	
14:00 – 15:00	Panel Session Room: P/X001	Workshop Panel Session P/L005
15:00 – 16:40	Technical Session 8 <ul style="list-style-type: none"> a) Adaptive modulation and interference mitigation – P/L002 b) Equalization, synchronization and channel estimation – P/T007 c) Spectrum sensing – P/L001 	Realisation of Cognitive Radio Networks P/L005
16:40 – 17:00	Coffee Break – concourse area	
17:00 – 18:40	Closing Ceremony Room: P/X001	Cognitive Multiple Access and Physical Layers P/L005
19:30 and 20:00	Tours York Brewery Tour, 12 Toft Green, York, YO1 6JT, Tel: +44 (0)1904 621162	

ISWCS 2010 Keynotes



Do Communication Engineers Need Circuit Circuit Theory?

Monday 20th Sep, 9:00 - 10:00, Room: P/X001

Prof. Josef A. Nossek, Member of the German National Academy of Engineering Sciences; Head of the Institute of Circuit Theory and Signal Processing, Full Professor, Munich University of Technology.

Abstract: Do communication and information engineers get the physics right in their models? Do the basic model structures adequately translate physical reality? These are the central questions which will be addressed in this lecture.

The high level of abstraction taken by information theory makes it a very versatile and powerful tool for the analysis and optimization of communications systems. But information theory has no concept of the flow of energy that accompanies the flow of information. Therefore, some important aspects of communication systems such as transmit power or noise covariance can by no means be straightforwardly mapped from the information theoretic context to technical reality. An effective method will be presented to complement information theory with such a mapping by applying classical circuit theory. This allows correct assessment of the energy flow in a communication system and thereby enables an information theoretic analysis and optimization which is consistent with the underlying physics. After developing appropriate circuit theoretic channel models, the potential performance of multi-antenna communication systems will be analyzed and surprising new results and insights will be revealed.

Biography: Josef A. Nossek (S'72--M'74--SM'81--F'93) received the Dipl.-Ing. and the Dr. techn. degrees in electrical engineering from the University of Technology in Vienna, Austria in 1974 and 1980, respectively. In 1974 he joined Siemens AG in Munich, Germany as a member of technical staff, in 1978 he became supervisor, and from 1980 on he was Head of Department. In 1987 he was promoted to be Head of all radio systems design. Since 1989 he has been Full Professor for circuit theory and signal processing at the Munich University of Technology where he teaches undergraduate and graduate courses on circuit and systems theory and signal processing and leads research on signal processing algorithms for communications, especially multiantenna systems. He was President Elect, President and Past President of the IEEE Circuits and Systems Society in 2001, 2002 and 2003 respectively. He was Vicepresident of VDE (Verband der Elektrotechnik, Elektronik und Informationstechnik e.V.) 2005 and 2006, President of VDE 2007 and 2008 and is Vicepresident again in 2009 and 2010.. His awards include the ITG Best Paper Award 1988, the Mannesmann Mobilfunk (now Vodafone) Innovations award 1998, the Award for Excellence in Teaching from the Bavarian Ministry for Science, Research and Art in 1998. From the IEEE Circuits and Systems Society he received the Golden Jubilee Medal for 'Outstanding Contributions to the Society' in 1999 and the Education Award in 2008. In 2008 he also received the Order of Merit of the Federal Republic of Germany and in 2009 he has been elected member of the German National Academy of Engineering Sciences (acatech).



Self-organization in Mobile Communication Systems

Monday 20th Sep, 14:00 - 15:00, Room: P/X001

Prof. Andreas Mitschele-Thiel, Head of the Integrated Communication Systems group, Full professor at the Ilmenau University of Technology, Germany.

Abstract: Today's mobile communication systems are highly static and inflexible with regard to changes. This prevents the fast implementation of innovative ideas as well as the fast adaptation to changes of the environment, e.g. to changing service demands, changing traffic loads or traffic distributions in mobile environments.

The talk will give an overview on the research issues addressed by the International Graduate School on Mobile Communications at the Ilmenau University of Technology. The School, currently comprising 9 professors and 30 doctoral students, is focusing on interdisciplinary topics in mobile communications, especially the application of methods for self-organization to allow for the automatic recovery of communication systems from natural disasters or terrorist attacks.

The research goal of the School is to develop mechanisms for the autonomous, dynamic, distributed coordination (self-organization) of future mobile communication systems. We apply self-organization to the radio system, to protocols and the network as a whole. Our specific application scenarios are disaster networks, requiring an aggressive approach to network operation. The coordinated adaptation of radio, protocols and network aspects is essential to provide communication services in disaster scenarios, e.g. the localization of individuals or to support emergency communication.

Biography: Andreas Mitschele-Thiel is a full professor at the Ilmenau University of Technology, Germany, and head of the Integrated Communication Systems group. In addition, he is the head of the International Graduate School on Mobile Communications of the University. 2005 to 2009, he also served as Dean for the Faculty for Computer Science and Automation. In addition, he is co-founder and scientific director of two research spin-offs of the university: Cuculus is a leader in open service platforms for smart metering and home automation. IDEO Laboratories is focusing on VoIP-based telecommunications.

He received a Diploma in Computer Engineering from the Fachhochschule Esslingen in 1985, a M.S. in Computer and Information Science from The Ohio State University in 1989 and a Doctoral degree in Computer Science from the University of Erlangen in 1994. He completed his habilitation in Computer Science at the University of Erlangen in 2000. 1996 to 2000 he served as head of the research group on Design Methodologies at the University of Erlangen. During this period he also served as Associated Rapporteur at the International Telecommunication Union (ITU) where he was responsible for Time and Performance in SDL.

Andreas Mitschele-Thiel has held various positions in the telecommunication industry. 2000 to 2003 he was with the Wireless Advanced Technologies Lab of Lucent Technologies. At Lucent he served as project manager for the IPonAir project, focusing on the evolution of 3G systems, funded by the German Ministry for Education and Research. Prior to this he has held various positions at Alcatel.



Adaptive Networks and Bio-Inspired Cognition

Tuesday 21st Sep, 9:00 – 10:00, Room: P/X001

Prof. Ali H. Sayed, Director of the Adaptive Systems Laboratory,
Professor and Chairman of Electrical Engineering at UCLA.

Abstract: The emerging interest in cognitive networks, smart grids, and self-organizing networks is motivating heightened research on collaborative processing strategies that enable networks to learn and respond to information in real-time. Adaptive networks are well-suited to perform decentralized information processing and decentralized inference tasks. They are also well-suited to model self-organizing behavior such as animal flocking and swarming. These networks avoid centralized processing and perform in-network inference and control decisions without relying on omnipotent agents (or fusion centers). This is because solutions that rely on information fusion are not scalable, are hard to adapt to changing network conditions, and create single points of vulnerability and information bottlenecks.

Adaptive networks consist of spatially distributed agents that are linked together through a connection topology. The topology may vary with time and the nodes may also move. The agents cooperate with each other through local interactions and by means of in-network processing. The diffusion of information across the network results in various forms of self-organizing behavior and collective intelligence. A key property of adaptive networks is that all agents behave in an isotropic manner and are assumed to have similar abilities. This kind of behavior is common in many socio-economic and life and biological networks where no single agent is in command.

This talk describes recent developments in distributed processing over adaptive networks and illustrates the techniques by studying self-organization in biological networks such as bird formations, fish schooling, bee swarming, and bacteria motility.

Biography: Ali H. Sayed is Professor and Chairman of Electrical Engineering at UCLA where he directs the Adaptive Systems Laboratory (www.ee.ucla.edu/asl). He has published widely in the areas of adaptation and learning with over 300 articles and 5 books. He is the author of the textbooks *Fundamentals of Adaptive Filtering* (Wiley, NJ, 2003), and *Adaptive Filters* (Wiley, NJ, 2008). He is a Fellow of IEEE and has served as Editor-in-Chief of the IEEE Transactions on Signal Processing (2003-2005) and the EURASIP J. Advances in Signal Processing (2006-2007). His research has received several recognitions including the 1996 IEEE D. G. Fink Prize, a 2002 Best Paper Award from the IEEE Signal Processing Society, the 2003 Kuwait Prize, the 2005 Terman Award, a 2005 Young Author Best Paper Award from the IEEE Signal Processing Society, and two Best Student Paper Awards at international meetings (1999, 2001). He served as a 2005 Distinguished Lecturer of the IEEE Signal Processing Society. He has been a member of the Publications (2003-2005), Awards (2005), and Conference (2007-present) Boards of the IEEE Signal Processing Society. He served as General Chairman of ICASSP 2008, as member of the Board of Governors (2007-2008) of the IEEE Signal Processing Society, and is now serving as Vice-President (Publications) of the same society (2009-present).



Cooperation in Cellular Networks: Taking a new look at interference

Tuesday 21st Sep, 14:00-15:00, Room: P/X001

Prof. David Gesbert, Head of the Communications Theory Group, Professor in the Mobile Communications Dept., EURECOM, France.

Abstract: As it is well known to wireless system designers, fading limits the reliability of point to points radio links while interference limits their spatial reusability.

As the performance of practical point to point links is now approaching its fundamental $\log(1+\text{SNR})$ rate limit, increasing further the capacity of wireless systems will require the adoption of a new truly multi-terminal view of the network, i.e. a view where the impact of interference is fully accounted for in the design of transmission algorithms. This is in contrast with traditional designs, where interference has been dealt with a combination of resource allocation protocols at the link layer (with soft to hard orthogonality constraints) together with robust coding and detection schemes at the PHY layer. Recent results in the domain of cooperative communications have revealed however that interference can be efficiently tackled, or even exploited, via a proper treatment at the transmitter side, involving the concept of coordination among the interfering transmitters, as in so-called network MIMO or interference alignment to name a few examples of popular methods. In this talk we emphasize the promise of such methods, yet also how the coordination gains come at a substantial price in terms of exchanging information across the devices. After giving an overview comparing such techniques, we are addressing the coordination gain/cost trade-off. Finally we look at some promising research avenues in the domain of distributed interference avoidance and exploitation.

Biography: David Gesbert (IEEE SM) is Professor in the Mobile Communications Dept., EURECOM, France, where he heads the Communications Theory Group. He obtained the Ph.D degree from Ecole Nationale Supérieure des Telecommunications, France, in 1997. From 1997 to 1999 he has been with the Information Systems Laboratory, Stanford University. In 1999, he was a founding engineer of Iospan Wireless Inc, San Jose, Ca., a startup company pioneering MIMO-OFDM (now Intel). Before joining EURECOM, he has been with the Department of Informatics, University of Oslo. D. Gesbert has published about 170 papers and several patents all in the area of signal processing, communications, and wireless networks.

D. Gesbert was a co-editor of several special issues on wireless networks and communications theory, for JSAC (2003, 2007, 2009), EURASIP Journal on Applied Signal Processing (2004, 2007), Wireless Communications Magazine (2006). He served on the IEEE Signal Processing for Communications Technical Committee, 2003-2008. He's an associate editor for IEEE Transactions on Wireless Communications and the EURASIP Journal on Wireless Communications and Networking. He authored or co-authored papers winning the 2004 IEEE Best Tutorial Paper Award (Communications Society) for a 2003 JSAC paper on MIMO systems, 2005 Best Paper (Young Author) Award for Signal Proc. Society journals, and the Best Paper Award for the 2004 ACM MSWiM workshop. He co-authored the book 'Space time wireless communications: From parameter estimation to MIMO systems', Cambridge Press, 2006.



High-Throughput Block Transceivers

Wednesday 22nd Sep, 9:00 - 10:00, Room: P/X001

Prof. Paulo S. R. Diniz, IEEE Fellow, full Professor at the Federal University of Rio de Janeiro (UFRJ) in Brazil.

Abstract: The standard designs of multicarrier and single-carrier transceivers employing frequency-domain equalization require an amount of redundancy of at least the order of the channel. This redundancy eliminates the inherent inter-block interference (IBI), and allows the exploitation of the resulting channel matrix to design superfast zero-forcing (ZF) and minimum mean squared error (MMSE) equalizers.

Although it is well known that the minimum redundancy for IBI-free designs of fixed and memoryless transceivers is around half of the channel order, all practical solutions do not employ minimum redundancy. This presentation introduces in a unified way a family of block transceivers with superfast implementation employing a range values for the redundancy starting from the minimum. The related designs of practical ZF and MMSE transceivers are presented and their performances are compared in terms of throughput for fixed bit-error rate.

The main feature of the proposed transceivers is their higher throughput allowing the use of the wireless and wired channels more effectively.

Biography: Paulo S. R. Diniz received Ph.D. degree from Concordia University, Canada, and is a full Professor at the Federal University of Rio de Janeiro (UFRJ) in Brazil. He served as Undergraduate Course Coordinator and as Chairman of the Graduate Department. He is one of the three senior researchers and coordinators of the National Excellence Center in Signal Processing. He has also received the Rio de Janeiro State Scientist award, from the Governor of Rio de Janeiro state. He has published several refereed papers in some of these areas and wrote two books ADAPTIVE FILTERING: Algorithms and Practical Implementation, Springer, Third Edition 2008, and DIGITAL SIGNAL PROCESSING: System Analysis and Design Cambridge University Press, Cambridge, UK, Second Edition 2010 (with E. A. B. da Silva and S. L. Netto).

He served as the Technical Programme Chair of the 1995 MWSCAS and SPAWC-2008. He also served as Vice President for region 9 of the IEEE Circuits and Systems (CAS) Society and as Chairman of the DSP technical committee of the same Society. He is also a Fellow of IEEE and the general co-chair of IEEE ISCAS-2011. He served as associate editor for the following Journals: IEEE Transactions on Circuits and Systems II: Analog and Digital Signal Processing from 1996 to 1999, IEEE Transactions on Signal Processing from 1999 to 2002, and the Circuits, Systems and Signal Processing Journal from 1998 to 2002. He was a distinguished lecturer of the IEEE CAS and Signal Processing Societies, and received the 2004 Education Award of the IEEE CAS Society. He has also received some best paper awards, including the Guillemin-Cauer award from the IEEE CAS Society.

ISWCS 2010 Tutorials



Wireless network coding: the network aware PHY layer

Sunday 19th Sep, 09:30 - 13:00, Room: P/L002

Prof. Jan Sykora, Czech Technical University in Prague.

Prof. Alister Burr, University of York, U.K.

Abstract: It is becoming widely accepted that the most significant future developments in the physical layer of wireless communication systems will not take place in the PHY layer of individual communication links, but rather in the context of complete wireless networks. Over the past decade or so there have been significant developments in network information theory which have shown that very significant overall performance gains are available compared to the conventional paradigm in which PHY techniques are applied to individual links only, leaving network aspects to be dealt with only at higher layers of the protocol stack. One such new research field is network coding, in which coding techniques are applied to multiple data streams at intermediate nodes in a network, rather than only to individual streams on single links. This can exploit network topology to significantly improve throughput in multiuser networks. However in its original form it operates at the level of data streams, rather than signal waveforms, and hence is not well suited to the inherently broadcast nature of wireless networks. Physical layer or wireless network coding (WNC) allows it to be applied directly to wireless networks, with a further significant improvement in efficiency. The key advance on conventional PHY techniques is that both signalling waveforms and node signal processing is aware of the network topology and exploits it to improve overall network throughput.

The first part of the tutorial will introduce wireless network coding in the context of network information theory and the network-aware PHY layer. It will consider potential applications, from high-capacity next generation wireless broadband access networks to extremely power-efficient wireless sensor networks, pointing out the benefits of network awareness in such applications, and hence it will outline some potential scenarios in which it might operate. It will then introduce some of the basic principles and strategies of WNC, for example the strategies of hierarchical decode/compress and forward which replace the amplify/decode and forward strategies of conventional relaying, and consider the network capacity regions that result.

The second part will focus on an important example scenario: the two-source relay channel (2S-RC) in which two sources simultaneously exchange information with two destinations with the aid of a single relay, which may frequently occur in a wireless access network. It will describe code design for this scenario, and the effect of fading parameters on performance. In doing so it will introduce a fundamental principle which allows separation between an inner hierarchical exclusive alphabet and an outer error control code, which can be a conventional binary capacity-approaching code such as a turbo or LDPC code.



Signal waveform design for underwater acoustic communications

Sunday 19th Sep, 09:30 - 13:00, Room: P/T007

Dr. Charalampos C. Tsimenidis, Newcastle University, School of Electrical, Electronic and Computer Engineering

Prof. Bayan S. Sharif, Newcastle University, School of Electrical, Electronic and Computer Engineering

Abstract: The tutorial will cover the design of signalling waveforms that are suitable for utilisation in underwater acoustic (UA) modems. These will include PN sequences with low auto and crosscorrelation properties, chirp design, in conjunction with pulse shaping and modulation schemes such as orthogonal frequency division multiple access (OFDM), direct sequence and multi-carrier code division multiple access (DS- and MC-CDMA). The tutorial will also address underwater channel modelling and simulation methodologies that are useful in evaluating dry performance of UA systems. Furthermore, the design of receiver algorithms will be considered that utilise adaptive receive arrays, carrier-phase and symbol timing recovery, Doppler compensation and multi-user detection methodologies. The tutorial is suitable for modem engineers with limited or no experience in this area to assist them in the design of UA based communication systems.

Biographies: Charalampos C. Tsimenidis is a Senior Lecturer in Signal Processing for Communications in the School of Electrical, Electronic, and Computer Engineering. He received his MSc with distinction and PhD from the University of Newcastle upon Tyne in 1999 and 2002, respectively. His main research interests are in the area adaptive array receivers for wireless communications including demodulation algorithms and protocol design for underwater acoustic channels. He has published over 90 conference and journal papers. During the last ten years he has made contributions in the area of receiver design to several European funded research projects including LOTUS, SWAN, and ACME.

Bayan S. Sharif is Professor of Digital Communications and Head of the School of Electrical, Electronic and Computer Engineering. He received the bachelor and doctorate degrees from Queen's University of Belfast and Ulster University, N. Ireland, in 1984 and 1988, respectively. He then held a Research Fellowship at Queen's University of Belfast before he was appointed as Lecturer at Newcastle University in 1990, and then as Senior Lecturer and Professor in Digital Communications in 1999 and 2000, respectively. Prof. Sharif has research interests in digital communications with a focus on wireless receiver structures and optimisation of wireless networks. He has published over 200 journal and conference papers, and held UK and EU research grants in digital communications, underwater acoustics and signal processing worth over £3M. He is a Chartered Engineer and Fellow of the IET.



Energy-Efficient Distributed Signal Processing in Mobile Wireless Sensor Networks

Sunday 19th Sep, 09:30 - 13:00, Room: P/L001

Dr. Loredana Arienzo, Institute for the Protection and Security of the Citizen Joint Research Center, European Commission

Abstract: Wireless mobile sensor networks are important for a number of strategic applications such as surveillance, fire detection, outlier detection. Energy is a critical resource in wireless sensor networks and system lifetime needs to be prolonged through the use of energy-efficient signal processing during system operation. In this talk an overview of statistical prediction frameworks for tracking dynamic targets in range-based signal processing is presented. The single mobile target algorithm has been evaluated by the metrics of tracking precision and network energy consumption. The computation of the posterior Cramer-Rao bound (PCRB) for range-based target tracking has been considered. PCRB is a theoretical lower bound on the estimation error while assessing the performance of any kind of estimation algorithm. Here the method is applied to a nonlinear filtering problem of tracking node in wireless sensor networks. The evaluation is performed using the constant velocity model and the path loss propagation model, respectively, as dynamic model and measurement model. The bound is computed against the root mean square error of two non linear filters: bootstrap and unscented particle filter. A novel tradeoff between the accuracy of the estimation bound and the energy consumption is also showed. The tutorial will conclude by discussing distributed data fusion algorithms based upon a Bayesian approach.

Biography: Loredana Arienzo is a researcher at the Institute for the Protection and the Security of the Citizen in the Joint Research Centre of European Commission since December 2008. She received her PhD in Information Engineering from the University of Salerno in 2008. Loredana Arienzo was a visiting researcher in BWN Lab, School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, in 2006. She received her B.Sc. and M.Sc. degree in Electronics Engineering from the University of Salerno (IT), in 1999 and her Associate degree in Software Engineering from the University of Benevento (IT), in 2001. Her research interests focus on wireless communications, ad-hoc and sensor networks, distributed signal processing, tracking in ad-hoc and wireless sensor networks, cognitive radio networks. She is part of the European Concerted Research Action IC0902: Cognitive Radio and Networking for Cooperative Coexistence of Heterogeneous Wireless Networks. Loredana Arienzo is a member of IEEE, IEEE Communication Society and ACM. She is a reviewer for IEEE Transactions on Vehicular Technology, IEEE Communications Letters and 2010 IARIA Advanced International Conference on Telecommunications.



Cognitive Radio Access to TV White Spaces: Spectrum Opportunities, Remaining Technology Challenges and Applications.

Sunday 19th Sep, 14:00 - 17:30, Room: P/L002

Dr. Maziar Nekovee, BT Research

The tutorial will draw on very recent research (both our own at BT) and others in this emerging area, as well as our recently published book, *Cognitive Radio Communications and Networks: Principle and Practice*, Wyglynski, Nekovee, Hou, January 2010

Abstract: Cognitive radio is being intensively researched as the enabling technology for secondary access to the so-called TV White Spaces (TVWS), large portions of spectrum in the UHF/VHF bands which become available on a geographical basis after digital switchover. Both in the US, and more recently, in the UK the regulators have given conditional endorsement to this new mode of access, and regulatory endorsement elsewhere is under debate.

This tutorial provides participants with a survey the state-of- the-art in technology (including spectrum sensing and detection, multi-user access and MAC), and coexistence and etiquette protocols) of cognitive access to TVWS. It examines regulation and standardisation of cognitive access to TVWS, the spectrum opportunity in the UK, US and elsewhere and the commercial use cases associated with this form of secondary access.



Adaptive Signal Processing of Noncircular Complex Signals

Sunday 19th Sep, 14:00 - 17:30, Room: P/L001

Dr. Danilo Mandic, Imperial College London, United Kingdom.

Prof. Scott Douglas, Southern Methodist University, TX, USA.

Tutorial Aims: This tutorial will bring together latest advances in augmented complex statistics and will introduce a suite of adaptive signal processing and blind source separation algorithms under the umbrella of widely linear modelling. Our aim is to:

- Provide a theoretical and computational platform for statistical signal processing of the generality of complex valued signals (both proper and improper);
- Give an in-depth insight into widely linear estimation, the role of noise and eigenstructure of correlation matrices;
- Revisit the complex gradient and Hessian, and introduce the CR calculus;
- Present tests for the degree of noncircularity and use this information as an additional degree of freedom in detection and estimation problems;
- Introduce a suite of adaptive signal processing algorithms suitable for the filtering of both second order circular and noncircular signals;
- Illustrate the performance and convergence of widely linear adaptive filtering algorithms for both circular and noncircular data;
- Introduce blind source separation and extraction algorithms in this context;
- Provide simulation studies, including prediction, tracking, beamforming, and source separation in communications and biomedicine.

Biographies: Danilo P. Mandic has been working in the area of nonlinear and adaptive signal processing for more than 15 years, and is now a Reader (Associate Professor) at the Department of Electrical and Electronic Engineering, Imperial College London, UK. His work on complex valued and nonlinear adaptive signal processing has been widely published, and some of the concepts relevant to this tutorial can be found in his research monographs *Recurrent Neural Networks for Prediction*, Wiley 2001 (with Professor J. Chambers) and *Complex Valued Nonlinear Adaptive Filters*, Wiley 2009 (with S. L. Goh). Dr. Mandic has been a Member of the IEEE Signal Processing Society Technical Committee on Machine Learning for Signal Processing, Associate Editor for *IEEE Transactions on Neural Networks*, *IEEE Transactions on Signal Processing*, *IEEE Transactions on Circuits and Systems II*, and Associate Editor for *International Journal of Mathematical Modelling and Algorithms*. He has authored several awarded papers and has received awards for products arising from his collaboration with industry.

Scott C. Douglas received the B.S. (with distinction), M.S., and Ph.D. degrees in Electrical Engineering from Stanford University, Stanford, CA. He is currently a Professor in the Department of Electrical Engineering at Southern Methodist University and the Associate Director of the Institute for Engineering Education at SMU. His research activities include adaptive filtering, active noise control, blind deconvolution and source separation, and VLSI/hardware implementations of digital signal processing systems. Dr. Douglas is the author or co-author of two books and about 200 articles in journals and conference proceedings. He is a senior member of the IEEE, a past associate editor for the *IEEE Transactions on Signal Processing* (IEEE), the *IEEE Signal Processing Letters* (IEEE), the *Journal of Signal Processing Systems* (Springer). He has served the General Chair of ICASSP 2010 and the Secretary of the Signal Processing Education Technical Committee of the IEEE Signal Processing Society. He has played an integral role in developing and managing the Infinity Project, an effort among university faculty, high-tech industry, and civic educational leaders to bring an exciting and practical engineering curriculum to all U.S. high school students.



Recent advances in Peak to Average Power Ratio reduction methods for multi-carrier systems

Sunday 19th Sep, 14:00 - 17:30, Room: P/T007

Prof. Yves Louët, SUPELEC, France

Abstract: This tutorial aims to overview the salient deficiency of Orthogonal Frequency Division Multiplexing (OFDM) modulation namely its high Peak to Average Power Ratio (PAPR). Firstly it aims to describe PAPR and secondly to propose an original classification of all well known mitigation methods. The last part of this tutorial details very promising methods (like Tone Reservation, Active Constellation Extension, etc.) which are about to be normalized in further telecommunication systems like digital video broadcasting, mobile telecommunications and wireless networks. Moving on from OFDM PAPR analysis, this tutorial is ended by an extension to multistandard signals scenario under the umbrella of emerging Software Radio and Cognitive Radio technologies.

The outline of the talk is the following:

Part I: PAPR fundamentals

- I-1 Definitions
- I-2 Theoretical expressions and upper bounds in OFDM context
- I-3 PAPR regarding non linear power amplification

Part II: PAPR mitigation methods in OFDM context

- II-1 Compromises to take into account
- II-2 Classification of methods
- II-3 Performances

Part III: PAPR today and tomorrow

- III-1 Current PAPR methods applied in telecommunications standards
- III-2 PAPR problem in Software radio (definition and methods)
- III-3 PAPR viewed as a sensor for Dynamic Spectrum Access in Cognitive Radio systems

Biography: Yves Louët was born in Quimperlé (France) in 1973. He is an engineer of the ISITV (Institute of Science Engineering), Toulon, France, 1996. He received his M.Sc. in Signal Processing from ENSPM (High National School of Physics), Marseille France, 1996 and his Ph.D. degree in Digital Communications in 2000 from Rennes 1 University, Rennes, France. The subject of his Ph.D. was about OFDM systems and PAPR with channel coding. After, he worked two years in SIRADEL, Rennes, France as expert in digital communications for radio channel propagation modelling. He is now Professor in SUPELEC, Rennes, France and his research activities concern PAPR mitigation methods and Software Radio in SCEE (Signal Communication and Embedded Electronic) lab of SUPELEC.

Detailed Technical Programme for Main Conference

Monday, 20th September, 10:00 – 12:10

a) Poster 1 - Underwater Acoustic Communications (special session)

Concourse area, Chair: Dr Yuriy Zakharov, University of York.

Broadband underwater source localization by solving basis pursuit de-noising,
Chunshan Liu, Teyan Chen, Yuriy Zakharov, University of York, UK.

EXIT Chart Analysis of BICM-ID Based Receiver for Shallow Underwater Acoustic Communications,
Chintan P. Shah, Charalampos C. Tsimeridis, Bayan Sharif, Jeffrey A. Neasham, University of Newcastle, UK.

Multi-Carrier Modulation for High-Rate Underwater Acoustic Communications,
Andrey K. Morozov, Lee E. Freitag, James C. Preisig, Woods Hole Oceanographic Institute, USA.

b) Poster 1 - Ultra Wideband Systems (special session)

Concourse area, Chair: Dr Detlef Fuehrer, Joint Research Centre (JRC) and Prof Takehiko Kobayashi, Tokyo Denki Univ.

A Quantitative Assessment of the Compatibility of Ultra Wideband with Radiolocation Services,
Joaquim Fortuny-Guasch, Alberto Rabbachin, Eduardo Cano-Pons, European Commission - Joint Research Centre, Italy.
Pablo Almorox, Universidad Politécnica de Madrid, Spain.
Detlef Fuehrer, Institute for the Protection and Security of the Citizen, JRC, Germany.

Experimental Evaluation of Avoid Performance with Various Victim Systems to Enable DAA for UWB,
Huan-Bang Li, National Institute of Information and Communications Technology (NICT), Japan.
Kunio Yata, TDK Corporation, Japan.
Kenichi Takizawa, National Institute of Information and Communications Technology (NICT), Japan.
Noriaki Miyazaki, KDDI R&D Laboratories, Japan.
Takashi Okada, NTT DOCOMO, INC, Japan.
Kohei Ohno, Tokyo University of Science, Japan.
Takuji Mochizuki, NEC Corporation, Japan.
Eishin Nakagawa, TELECOM ENGINEERING CENTER, Japan.
Takehiko Kobayashi, Tokyo Denki University, Japan.

Implementation of a wireless test bed for the functional verification of the Ultra-Wideband Detect-and-Avoid mechanism,
Detlef Fuehrer, Institute for the Protection and Security of the Citizen, Italy.
Gianmarco Baldini, European Commission Joint Research Centre, Belgium.
Janie Baños, Manuel García, AT4 wireless, Spain.
Xiaochen Chen, Telecommunication Metrology Center of MII, PR.China.

Introduction of MAP Estimation to UWB-IR TOA Localization,
Shinsuke Hara, City University, Japan.
Tomofumi Yabu, Osaka City University, Japan.
Ken-ichi Takizawa, National Institute of Information and Communications Technology (NICT), Japan.

System Implementation Study on RSSI based Positioning in UWB Networks,
Shangbo Wang, Andreas Waadt, Admir Burnic, Dong Xu, Christian Kocks, Guido H. Bruck, Peter Jung, University of Duisburg-Essen, Germany.

Evaluation of Detection Capability of Mobile WiMAX and 3GPP LTE DL Signals for Detect-and-Avoid (DAA) in UWB Systems,

Kenichi Takizawa, Huan-Bang Li, NICT, Japan.

Resource saving approach on Logical Link Control and Device Management Entity Layer for ECMA-368 based Devices,

Dirk Burggraf, Thomas Bartzsch, Axel Schmidt, Sven Zeisberg, University of Applied Science Dresden, Germany.

c) Poster 1 - Transmit Processing Techniques

Concourse area, Chair: Prof Gema Piñero, Universidad Politecnica de Valencia

Efficient Subcarrier Allocation in Downlink Multiuser MIMO-OFDM Systems,

Fan Wu, Mosa Ali Abu-Rgheff, University of Plymouth, UK.

Performance of Multiuser MIMO-OFDM Precoding Techniques with Quantized Channel Information,

Fernando Domene, Gema Piñero, Maria de Diego, Alberto González, Universidad Politecnica de Valencia, Spain.

Pre-Channel Compensation at Relay Station for MC-CDMA Downlink Relay System,

Haiyan Zheng, Takeo Fujii, University of Electro-Communications, Japan.

Switched Interleaving Techniques with Limited Feedback for Interference Mitigation in Uplink Multi-antenna MC-CDMA Systems,

Yunlong Cai, CNAM, France.

Rodrigo C. de Lamare, University of York, UK.

Didier Le Ruyet, CNAM, France.

Multi-User MIMO Precoding with Kerdock Codebook,

Mouncef Benmimoune, Daniel Massicotte, Université du Québec à Trois-Rivières, Canada.

Utility of Joint Processing Schemes,

Annika Klockar, Karlstad University, Sweden.

Carmen Botella, Tommy Svensson, Chalmers University of Technology, Sweden.

Anna Brunstrom, Karlstad University, Sweden.

Mikael Sternad, Uppsala University, Sweden.

Adaptive limited feedback for intercell interference cancelation in cooperative downlink multicell networks,

Berna Ozbek, Izmir Institute of Technology, Turkey.

Didier Le Ruyet, CNAM, France.

Monday, 20th September, 10:30 – 12:10

a) MIMO Systems I

Room P/L002, Chair: Prof J. Nassek, Munich University of Technology.

Adaptive frequency diversity in MIMO-OFDM systems based on spatial multiplexing,

Felip Riera-Palou, Guillem Femenias, University of the Balearic Islands, Spain.

Channel Prediction in Point-to-Point MIMO-Systems,

Nico Palleit, Tobias Weber, University of Rostock, Germany.

Multiple Feedback Successive Interference Cancellation with Shadow Area Constraints for MIMO systems,
Peng Li, Rodrigo C. de Lamare, University of York, UK.
Rui Fa, University of Leeds, UK.

Tree-search ML detection for underdetermined MIMO systems with M-PSK constellations,
Gianmarco Romano, Domenico Ciuonzo, Pierluigi Salvo Rossi, Francesco Palmieri, Seconda Università di Napoli, Italy.

Adaptive Matching for Compact MIMO Systems,
Reza Mohammad Khani, John S. Thompson, University of Edinburgh, UK.

b) Adaptive and Array Signal Processing

Room P/T007, Chair: Dr Charalampos Tsimenidis, University of Newcastle

Signal Processing in Digital Communications - The Fall of Science (Invited Paper),
Tor Aulin, Chalmers University of Technology, Sweden.

Robust R-D Parameter Estimation via Closed-Form PARAFAC in Kronecker Colored Environment,
Joao Paulo C. L. da Costa, Military Institute of Engineering (IME), Brazil.
Dominik Schulz, Florian Roemer, Martin Haardt, Ilmenau University of Technology, Germany.
Jose Antonio Apolinario Jr, Military Institute of Engineering (IME), Brazil.

Direction-of-Departure Estimation Using Cooperative Beamforming,
Zhijie Chen, Athanassios Manikas, Imperial College London, UK.

Adaptive reduced-rank LCMV beamforming algorithm based on the set-membership filtering framework,
Lei Wang, Rodrigo de Lamare, University of York, UK.

Adaptive Reduced-Rank Interference Suppression for DS-UWB Systems based on the Widely Linear Multistage Wiener Filter,
Nuan Song, Ilmenau University of Technology, Germany.
Rodrigo C. de Lamare, University of York, UK.
Mike Wolf, Martin Haardt, Ilmenau University of Technology, Germany.

c) Wireless Sensor Networks I

Room P/L001, Chair: Dr Loredana Arienzo, European Commission

Frequency-Hopping/M-ary Frequency-Shift Keying for Wireless Sensor Networks: Noncoherent Detection and Performance,
Fucheng Yang, Lie-Liang Yang, University of Southampton, UK.

BEACON Channel Estimation for Cooperative Wireless Sensor Networks Based on Data Selection,
Tong Wang, Rodrigo de Lamare, Paul D. Mitchell, University of York, UK.

Channel Aware Mobility for Self Organizing Wireless Sensor Swarms Based on Low Altitude Platforms,
Kai Daniel, Sebastian Rohde, Niklas Goddemeier, Christian Wietfeld, TU Dortmund University, Germany

A Complex Convex Relaxation for Approximate Maximum Likelihood 2D Energy-based Source Localization in Sensor Networks,
Marko Beko, ULHT, UNINOVA, ISR-IST, Portugal.

GOF Analysis for Gaussianity Assumption of Range Errors in WSN,
Imtiaz Rasool, Naveed Salman, Andrew Kemp, University of Leeds, UK.

Monday, 20th September, 15:00 – 16:40

a) Space-Time Coding and Processing

Room P/L002, Chair: Prof Jan Sykora, Czech Technical University

Adaptation of Golden Codes with a Correlated Rayleigh Frequency-Selective Channel in OFDM system with Imperfect channel Estimation,

Ahmed Bannour, National Engineering School of Tunis, Tunisia.

Mohamed Lassaad Ammari, National Engineering School of Sousse, Tunisia.

Ridha Bouallegue, National Engineering School of Tunis, Tunisia.

Analysis of Per-Tone Transmit Antenna Selection in OFDM Systems with Alamouti Coding,

Justin P. Coon, Magnus Sandell, Toshiba Research Europe Ltd, UK.

Space Time Codes based on Tensor Precoding Model,

Di Liu, Alister Burr, University of York, UK.

Source-assisting Strategy for Distributed Space-time Block Codes,

Gbenga Owojaiye, Fabien Delestre, Yichuang Sun, University of Hertfordshire, UK.

Extended Orthogonal Space-Time Block Coded Transmission with Quantised Differential Feedback,

Mohamed Nuri Hussin, Stephan Weiss, University of Strathclyde, UK.

b) Cooperative and Multicell Beamforming

Room P/T007, Chair: Prof Mounir Ghogho, University of Leeds

SIR Balancing for Strongly Connected Interference Networks -Existence and Uniqueness of a Solution (Invited Paper),

Martin Schubert, Nikola Vucic, Fraunhofer German-Sino Lab for Mobile Communications (MCI), Germany.

Holger Boche, Heinrich-Hertz Institute, Germany.

ISI Analysis in Network MIMO OFDM Systems with insufficient Cyclic Prefix Length,

Vincent Kotzsch, Wolfgang Rave, Gerhard Fettweis, Technische Universität Dresden, Germany.

Multiuser CoMP transmit processing with statistical channel state information at the transmitter,

Ligia Sousa, Tarcisio F. Maciel, Charles Casimiro Cavalcante, Federal University of Ceará, Brazil.

A Distributed Approach for Antenna Subset Selection in MIMO Systems,

Igor M. Guerreiro, Charles Casimiro Cavalcante, Universidade Federal do Ceará, Brazil.

c) Recent Advances on Implicit/Superimposed Training for Communications (special session)

Room P/L005, Chair: Dr D. C. McLernon, University of Leeds

Symbol-Blanking Superimposed Training for Orthogonal Frequency Division Multiplexing Systems,

Elsa Gayosso-Rios, Mauricio Lara, A. G. Orozco-Lugo, CINVESTAV-IPN, Mexico.

D. C. McLernon, University of Leeds, UK.

Channel Estimation in Time-Varying Flat-Fading Channel Using Superimposed Pilots with Interference Avoidance,

Jukka Talvitie, Toni Levanen, Markku Renfors, Tampere University of Technology, Finland.

A comment on the bandwidth expansion of Data Dependent Superimposed Training,

Patrik Bohlin, Qamcom Technology AB, Sweden.

Mikael Coldrey, Ericsson Research, Sweden.

Superimposed Training for Conventional and Code-Aided Timing Recovery in Turbo-Coded Systems,

S. Lirio Castellanos-López, A. G. Orozco-Lugo, Mauricio Lara, CINVESTAV-IPN, National Polytechnic Institute of Mexico, Mexico.

d) Cognitive Radio and Networking I

Room P/L001, Chair: Prof Honggang Zhang, Zhejiang University

Efficient Uplink Subcarrier and Power Allocation Algorithm in Cognitive Radio Networks,

Musbah Shaat, Faouzi Bader, Centre Tecnològic de Telecomunicacions de Catalunya-CTTC, Spain.

RF Signal Strength based Clustering Protocols for a Self-Organizing Cognitive Radio Network,

Aizat Ramli, David Grace, University of York, UK.

A Novel Harmony Search based Spectrum Allocation Technique for Cognitive Radio Networks,

Javier Del Ser, TECNALIA-TELECOM, Spain.

Marja Matinmikko, VTT Technical Research Centre of Finland, Finland.

Sergio Gil-Lopez, TECNALIA-TELECOM, Spain.

Miia Mustonen, VTT Technical Research Centre of Finland, Finland.

Fast Frequency-Hopping Dynamic Multiple-Access for Cognitive Radios: Suboptimum Noncoherent Maximum-Likelihood Multiuser Detection,

Shuo Zhang, Lie-Liang Yang, University of Southampton, UK.

Youguang Zhang, Beihang University, PR.China.

OFDMA Cognitive Radio Medium Access Control using Multichannel ALOHA,

Sangho Choe, The Catholic University of Korea, Korea.

Monday, 20th September, 17:00 – 18:40

a) Relaying Techniques I

Room P/L002, Chair: Prof Lie-Liang Yang, University of Southampton

Noncoherent Multi-Way Relay Based on Fast Frequency-Hopping M-ary Frequency-Shift Keying,

Jianfei Cao, Lie-Liang Yang, University of Southampton, UK.

Zhangdui Zhong, Beijing Jiaotong University, China.

Performance Analysis of Best Relay Selection Scheme for Fixed Gain Cooperative Networks in Non-Identical Nakagami-m Channels,

Syed Imtiaz Hussain, Mohamed-Slim Alouini, Texas A&M University at Qatar, Qatar.

Dr Mazen Hasna, Qatar University, Qatar.

Energy Consumption and Optimal Relay Node Placement for Cooperative Retransmissions,

Xin He, Frank Y. Li, University of Agder, Norway.

Joint Interference Suppression and Power Allocation Techniques for Multiuser Multiantenna Relay Broadcast Systems,

Yunlong Cai, Didier Le Ruyet, Daniel Roviras, CNAM, France.

Outage Analysis of Opportunistic Decode-and-Forward Relaying,
Kamel Tourki, Texas A&M University at Qatar, Qatar.
Hong-Chuan Yang, University of Victoria, Canada.
Mohamed-Slim Alouini, KAUST, Kingdom of Saudi Arabia.

b) Precoding and Scheduling

Room P/T007, Chair: Prof Alister Burr, University of York

Combating Noise Gains in High-Throughput Block Transceivers Using CSI at the Transmitter,
Wallace Alves Martins, Paulo Sergio Ramirez Diniz, Federal University of Rio de Janeiro, Brazil.

Impact of Co-channel Interference on the Performance of Adaptive Non-ideal Generalized Transmit Beamforming,
Redha M. Radaydeh, Mohamed-Slim Alouini, KAUST, Saudi Arabia.

Low-Complexity Calibration of Mutually Coupled Non-Reciprocal Multi-Antenna OFDM Transceivers,
Mark Petermann, Markus Stefer, Dirk Wübben, Martin Schneider, Karl-Dirk Kammeyer, University of Bremen, Germany.

Optimal User Scheduling and Allocation for WiMAX OFDMA Systems,
Muayad Al-Janabi, Charalampos C. Tsimenidis, Bayan Sharif, Stephane Le-Goff, University of Newcastle, UK.

An Evaluation of Precoding Techniques for Multiuser Communication Systems,
Sandra Roger, Fernando Domene, Alberto González, Vicenç Almenar, Gema Piñero, Technical University of Valencia, Spain.

c) Cellular Networks

Room P/L005, Chair: Dr Dave Pearce, University of York

Guaranteed Handover Schemes for a Multilayer Cellular System,
Shufeng Li, National University of Defense Technology, PR. China.
David Grace, University of York, UK.
Jibo Wei, Dongtang Ma, National University of Defense Technology, PR. China.

Vehicular radio connectivity in urban environment,
Kahina Ait Ali, Université de Technologie de Belfort-Montbéliard (UTBM) (University of Technology of Belfort-Montbéliard), France.
Alexandre Gondran, Ecole Nationale de l'Aviation Civile (The French Civil Aviation University), France.
Alexandre Caminada, Laurent Moalic, Université de Technologie Belfort-Montbéliard (UTBM) (University of Technology of Belfort-Montbéliard), France.

Multi-antenna Cell Constellations for Interference Management in Dense Urban Areas,
Syed Fahad Yunus, Jussi Turkka, Panu Lahdekorpi, Tero Isotalo, Jukka Lempiäinen, Tampere University of Technology, Finland.

The tradeoff between energy efficiency and system performance of femtocell deployment,
Fengming Cao, Zhong Fan, Toshiba Research Europe, UK.

Indoor WCDMA/HSDPA: Field and Analytical Results on Coverage and Throughput,
Grace Braz, Roger Pierre Fabris Hoefel, Federal University of Rio Grande do Sul, Brazil.

d) Wireless Mesh and Multi-Hop Networks

Room P/L001, Chair: Dr Andrew Kemp, University of Leeds

A High Performance Congestion Control Scheme for Streaming Transmission over Wireless Mesh Networks,
Shancang Li, Xinheng Wang, Xu Zhou, Xidian University, PR.China.

Profit-Oriented Combination of Multiple Objectives for Planning and Configuration of 4G Multi-Hop Relay Networks,
Alexander Engels, Michael Reyer, Rudolf Mathar, RWTH Aachen University, Germany.

Performance Analysis of Multihop Connectivity in VANET,
Saied M. Abd El-atty Soliman, Menoufia University, Egypt.
Georgios K. Stamatiou, Data Concept, Greece.

Improved Mesh WSN Support For A Realistic Mobility Model,
Tudorache ion Gabriel, Ana Maria Popescu, Andrew Kemp, University of Leeds, UK.

Selection Criteria of Cooperative Nodes for Reliable Wireless Multi-Hop Data Transmission,
Masaki Kubo, Daisuke Anzai, Shinsuke Hara, Osaka City University, Japan.

Tuesday, 21st September, 10:00 – 12:10

a) Poster 2 - Advances on adaptive signal processing (special session)

Concourse area, Chair: Prof Vítor H. Nascimento, University of São Paulo

A Competitive Algorithm Approach to Adaptive Filtering,
Andrew Singer, University of Illinois, USA.
Suleyman Serdar Kozat, Koc University, Turkey.

A Regularised Normalised Augmented Complex Least Mean Square Algorithm,
Yili Xia, Soroush Javidi, Danilo P. Mandic, Imperial College London, UK.

An Alternative Criterion for Regularization in Recursive Least-Squares Problems,
Manolis Tsakiris, Cassio Guimaraes Lopes, Patrick Naylor, Imperial College London, UK.

Combination of supervised and semi-supervised regression models for improved unbiased estimation,
Jeronimo Arenas-Garcia, Carlos Moriana-Varo, University Carlos III of Madrid, Spain.
Jan Larsen, The Technical University of Denmark, Denmark.

Efficient Implementation of a Variable Projection Order Affine Projection Algorithm,
Felix Albu, Constantin Paleologu, Politehnica University of Bucharest, Romania.
Jacob benesty, Universite du Quebec, Canada.

FPGA implementation of affine projection adaptive filter using coordinate descent iterations,
Jie Liu, RF Engines Ltd, UK.
Yuriy Zakharov, University of York. UK.

Mobile Adaptive Networks with Self-Organization Abilities,
Sheng-Yuan Tu, Ali H. Sayed, University of California, Los Angeles, USA.

New Adaptive Algorithms for Identification of Sparse Impulse Responses - Analysis and Comparisons,
Mariane R. Petraglia, Federal University of Rio de Janeiro, Brazil.
Diego B. Haddad, CEFET-RJ - Nova Iguaçu, Brazil.

On the steady-state MSE performance of the set-membership NLMS algorithm,
Markus Vinícius Santos Lima, Paulo Sergio Ramirez Diniz, Federal University of Rio de Janeiro, Brazil.

Joint Model-Order and Step-Size Adaptation with Convex Combinations of Reduced-Rank Adaptive Filters,

Rodrigo de Lamare, University of York, UK.
Vitor H. Nascimento, University of Sao Paulo. Brazil.

Reduced-Complexity Widely Linear Adaptive Estimation,

Fernando G. de Almeida Neto, Vitor H. Nascimento, Magno T. M. Silva, University of São Paulo, Brazil.

An Adaptive LCMV Beamforming Algorithm Based on Dynamic Selection of Constraints,

Rui Fa, University of Leeds, UK.

Rodrigo C. de Lamare, University of York, UK.

b) Poster 2 – Spread spectrum, multicarrier communications and relaying techniques

Concourse area, Chair: Prof Jonathon Chambers, Loughborough University

Performance of Selection Cooperation in the Presence of a Malicious Relay,

Rajeev Gangula, R. Bhattacharjee, Indian Institute of Technology Guwahati, India.

Distributed Quasi-orthogonal Space-Time Coding For Two-Way Wireless Relay Networks,

Faied Abdurahman, Abdulghani Elazreg, Jonathon Chambers, Loughborough University, UK.

STBC Cooperative Relay for Packet Broadcasting,

Yueting Hu, Takeo Fujii, University of Electro-Communications, Japan.

Resource Allocation for Multi-hop Cooperative MIMO Systems in Ad Hoc Networks,

Haitao Zhao, National University of Defense Technology, China.

Emiliano Garcia-Palacios, Queen's University Belfast, UK.

Yong Xi, Jibo Wei, National University of Defense Technology, China.

Analysis of ICI compensation in DVB-T2,

Pello Ochandiano, Iker Sobron, Lorena Martinez, Mikel Mendicute, Jon Altuna, University of Mondragon, Spain.

Nonlinear DOA Estimation for CDMA System in Impulsive Wireless Channels,

Mohamed Hassan, Naser Nations University, Libya.

Performance Analysis of Fixed and Mobile WiMAX MC-CDMA-Based System,

Rabah W. Aldhaferi., King Abdul Aziz University, Saudi Arabia.

Ali H. Al-Qahtani, Abha Technical College, Saudi Arabia.

User based vs. Frequency based Resource Occupation Ordering in Packet Scheduling in OFDMA Systems,

Israel Guio, Ángela Hernández-Solana, Vanesa Montero, Antonio Valdovinos, University of Zaragoza, Spain.

Joint Model for Fine Synchronization and Adaptive LMMSE Channel Estimation in Uplink OFDMA,

Kamran Khan, Heinrich-Hertz Institut, Germany.

Andreas Ibing, TU Berlin, Germany.

Dirk Dahlhaus, University of Kassel, Germany.

Tuesday, 21st September, 10:30 – 12:10

a) MIMO Systems II

Room P/L002, Chair: Dr Li Zhang, University of Leeds

Adaptive MLSD for MIMO transmission systems with unknown subchannel orders,

Manuel A. Vázquez, Joaquín Miguez, Universidad Carlos III de Madrid, Spain.

Factor Graph based Detection and Channel Estimation for MIMO-OFDM Systems in Doubly Selective Channel,

Xiang Xu, Rudolf Mathar, RWTH Aachen University, Germany.

A Novel FBMC Scheme for Spatial Multiplexing with Maximum Likelihood Detection,

Rostom Zakaria, Didier Le Ruyet, Conservatoire National des Arts et Métiers (CNAM), France.

Multiplexing Gain of Multiuser MIMO on Finite Scattering Channels,

Alister Burr, University of York, UK.

Grassmannian Precoding for Multi-User MIMO System Based on the Maximal SJNR Criterion,

Mouncef Benmimoune, Daniel Massicotte, Université du Québec à Trois-Rivières, Canada.

b) Detection and Estimation

Room P/T007, Chair: Dr Danilo Mandic, Imperial College

Optimum Detection in Spatially Uncorrelated SIMO Rayleigh Fast Fading Channels with Imperfect Channel Estimation,

Junruo Zhang, Yuriy Zakharov, Rami Khal, University of York, UK.

Centralized Synchronization Methods for Distributed Detection in Sensor Networks,

Ignacio Olabarrieta, Javier Del Ser, TECNALIA-Telecom, Spain.

A Constrained IQRD-RLS Blind Detection Algorithm for CDMA Transmission Systems in Multipath Channels,

Cesar A. Medina, Raimundo Sampaio-Neto, Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Brazil.

Comparison of Accuracy and Complexity of Advanced Frequency Estimators,

Rami Khal, University of York, UK.

Analysis of a Reduced Complexity Generalized Minimum Mean Square Error Detector,

Tharwat Morsy, Klaus Hueske, Jürgen Götze, TU Dortmund University, Germany.

c) Ultra Wideband Communications

Room P/L005, Chair: Prof Roger J. Green, University of Warwick

A Digital Non-Coherent Ultra-Wideband Receiver using a Soft-Limiter for Narrowband Interference Suppression,

Nuan Song, Mike Wolf, Martin Haardt, Ilmenau University of Technology, Germany.

Evaluation of TH UWB Capacity in the Presence of Synchronization Errors,

Bo Zhao, Yunfei Chen, Roger J. Green, University of Warwick, UK.

Blind Joint Iterative Optimization Reduced-rank Adaptive Receiver for DS-UWB Systems Based on Constrained Constant Modulus Criterion,

Sheng Li, University of York, UK.

Rodrigo C. de Lamare, University of York, UK.

Time-Hopping M-Walsh UWB Transmission Scheme for a One-Bit Non-Coherent Receiver,

Nuan Song, Mike Wolf, Martin Haardt, Ilmenau University of Technology, Germany.

d) Wireless Sensor Networks II

Room P/L001, Chair: Dr David Grace, University of York

Wireless Sensor Network Wormhole Avoidance Using Reputation-Based Routing,

James Harbin, Paul D. Mitchell, Dave Pearce, University of York, UK.

Cross Layer Design for QoS Aware Energy Efficient Data Reporting in WSN,

Zeeshan Ali Khan, Michel Auguin, Cécile Belleudy, LEAT-CNRS, University of Nice-Sophia Antipolis, France.

Energy-Aware Fault-Tolerant Clustering Scheme for Target Tracking Wireless Sensor Networks,

Sania Bhatti, Jie Xu, University of Leeds, UK.

Mohsin Memon, University of Tsukuba, Japan.

Enhancing Mobile Adhoc Networks Through Node Placement and Topology Control,

Robert A Hunjet, Defence Science and Technology Organisation, Australia.

Andrew Coyle, Matthew Sorell, University Of Adelaide, Australia.

Tuesday, 21st September, 15:00 – 16:40

a) Relaying Techniques II

Room P/L002, Chair: Prof Rudolf Mathar, RWTH Aachen University

Power Versus Relay Selection in Adaptive Relay Networks,

Aimal Khan, Volker Kuehn, University of Rostock, Germany.

A Novel Framework on Exact Average Symbol Error Probabilities of Multihop Transmission over Amplify-and-Forward Relay Fading Channels,

Ferkan Yilmaz, King Abdullah University of Science and Technology (KAUST), Saudi Arabia.

Oguz Kucur, Gebze Institute of Technology (GYTE), Turkey.

Mohamed-Slim Alouini, King Abdullah University of Science and Technology (KAUST), Saudi Arabia.

Distance-related Energy Consumption Analysis for Mobile/Relay Stations in Heterogeneous Wireless Networks,

Ziaul Haq Abbas, Frank Y. Li, University of Agder, Norway.

Link Performance Prediction Methods for Cooperative Relaying in Wireless Networks,

Mihai-Alin Badiu, Mihaly Varga, Vasile Bota, Technical University of Cluj-Napoca, Romania.

Full Interference Cancellation for An Asymptotically Full Rate Asynchronous Cooperative Four Relay Network,

Gaojie Chen, Jonathon Chambers, Loughborough University, UK.

b) Error-Control Coding

Room P/T007, Chair: Dr Stéphane Le Goff, University of Newcastle

Improving the Performance of Luby-Transform Codes (Invited Paper)

Weiler Finamore, Marcelo C. Ramos, CETUC-PUC-RIO, Brazil.

Type-I HARQ Scheme Using LDPC Codes and Partial Retransmissions for AWGN and Quasi Static Fading Channels,

André Gustavo Degraf Uchôa, Richard Demo Souza, UTFPR, Brazil.

Marcelo Eduardo Pellenz, PUC-PR, Brazil.

Joint Channel Decoding and Physical-Layer Network Coding in Two-Way QPSK Relay Systems by a Generalized Sum-Product Algorithm,

Dirk Wübben, University of Bremen, Germany.

Throughput Comparison of Automatic Repeat Request Assisted Butterfly Networks,
Yang Qin, Lie-Liang Yang, University of Southampton, UK.

The Stability of LDPC Codes over GF(q) with Higher Order Modulation Schemes,
Vajira Ganepola, Rolando Carrasco, University of Newcastle, UK.
Ian J. Wassell, University of Cambridge, UK.

c) Underwater Acoustic Communications (special session)

Room P/L005, Chair: Dr Yuriy Zakharov, University of York.

Doppler estimation and data detection for underwater acoustic ZF-OFDM receiver,
Alain Kibangou, University Joseph Fourier, France.
Laurent Ros, Grenoble-INP, France.
Cyrille Siclet, University Joseph Fourier, France.

Performance Comparison of IDMA Receivers for Underwater Acoustic Channels,
Salah Aliesawi, Charalampos C. Tsimenidis, Bayan Sharif, Martin Johnston, University of Newcastle, UK.

Practical Application of Turbo Equalization to Underwater Acoustic Communications,
Andrew Singer, Jun Won Choi, Thomas J. Riedl, University of Illinois, USA.
Kyeongyeon Kim, Purdue University, USA.
James Preisig, Woods Hole Oceanographic Institute, USA.

Underwater Modem-Based Navigation Aids,
Dale Green, Teledyne benthos, USA.

Underwater Acoustic Communications: Practice, Modeling, and Commentary,
Dale Green, Teledyne benthos, USA.

d) Cognitive Radio and Networking II

Room P/L001, Chair: Prof Honggang Zhang, Zhejiang University

Neuro-Fuzzy Signal Classifier (NFSC) for Standard Wireless Technologies,
Kaleem Ahmad, Ganesh Shresta, Uwe Meier, Institute Industrial IT, OWL University of Applied Sciences, Germany.
Halina Kwasnicka, Wroclaw University of Technology, Poland.

An Image Processing Approach to Distributed Access for Multiantenna Cognitive Radios,
Mauro Biagi, Valentina Polli, University of Rome La Sapienza, Italy.
Jose Alberto Andrade Freitas, University of Caracas, Venezuela.

Joint Cross-Layer Resource Allocation and Interference Avoidance with QoS Support for Multiuser Cognitive Radio Systems,
Hailan Peng, Takeo Fujii, University of Electro-Communications, Japan.

Cognitive Pilot Channels for Femto-cell Deployment,
Russell J. Haines, Toshiba Research Europe Ltd, UK.

Tuesday, 21st September, 17:00 – 18:40

a) Cooperative Communications and Interference Management

Room P/L002, Chair: Prof David Gesbert, Eurecom Institute

Increasing Mobile Rates while Minimizing Cost per Bit - Cooperation vs. Denser Deployment,
Patrick Marsch, Albrecht Fehske, Gerhard Fettweis, Technische Universität Dresden, Germany.

Radio resource management in OFDMA systems for strong frequency reuse in sectorized deployments,
Israel Guio, Ángela Hernández-Solana, Juan Cholí, Vanesa Montero, Javier Lafuente, Antonio Valdovinos, University of Zaragoza, Spain.

Frequency Planning of Clustered Cellular Network using Particle Swarm Optimization,
Maryam Riaz, Muhammad Ali Imran, Reza Hoshyar, University of Surrey, UK.

A message passing approach for multi-cellular OFDMA systems,
Andrea Abrardo, Marco Belleschi, Paolo Detti, University of Siena, Italy.
Marco Moretti, University of Pisa, Italy.

Decode-and-forward cooperation as the distributed encoding and decoding,
Saif E. A. Alnawayseh, Pavel Loskot, Swansea University, UK.

b) Antennas and Propagation

Room P/T007, Chair: Dr John Dawson, University of York

Dual-polarized Synthetic Array for Indoor GNSS Handheld Applications,
Vahid Dehghanian, Mohammadreza Zaheri, John Nielsen, Gerard Lachapelle, University of Calgary, Canada.

Land Use Classification as a Key Component for Path Loss Prediction in Rural Areas,
Melanie Neunerdt, Alexander Engels, Rudolf Mathar, RWTH Aachen University, Germany.

Multiband Fractal PIFA (Planar Inverted F Antenna) for Mobile Phones,
Saidatul Norlyana Azemi, P.J.Soh, University Malaysia Perlis, Malaysia.
Yichuang Sun, David Lauder, University of Hertfordshire, UK.
A.A.H.Azremi, University Malaysia Perlis, Malaysia.

A New Simple Model for Composite Fading Channels: Second Order Statistics and Channel Capacity,
Ferkan Yilmaz, Mohamed-Slim Alouini, King Abdullah University of Science and Technology (KAUST), Saudi Arabia.

Site-Specific Validation of Indoor RF Models for Commercial Propagation Topologies at 2.4 GHz,
Theofilos Chrysikos, Giannis Georgopoulos, Stavros A. Kotsopoulos, University of Patras, Greece.
Dimitrios Zevgolis, Hellenic Open University, Greece.

c) Protocols

Room P/L001, Chair: Prof Victor Leung, University of British Columbia

Delay Comparison of Automatic Repeat Request Assisted Butterfly Networks,
Yang Qin, Lie-Liang Yang, University of Southampton, UK.

Throughput, Bit-Cost, Network State Information: Tradeoffs in Cooperative CSMA Protocols,
Georg Boecherer, Rudolf Mathar, RWTH Aachen University, Germany.

MAD: A Dynamically adjustable Hybrid Location- and Motion-based Routing Protocol for VANETs,
Ioannis Manolopoulos, Kimon Kontovasilis, Institute of Informatics & Telecommunications, Greece.
Ioannis Stavrakakis, National & Kapodistrian University of Athens, Greece.
Stelios C. A. Thomopoulos, Institute of Informatics & Telecommunications, Greece.

Overview of the IEEE 802.15.4 standards family for Low Rate Wireless Personal Area Networks,
Naveed Salman, Andrew Kemp, University of Leeds, UK.

Exploiting multiuser diversity using traffic knowledge: Next Generation Wireless Schedulers,
Emi Garcia, Steven Walsh, Queens University Belfast, UK.

d) Self-organization in Mobile Communication Systems (special session)

Room P/L005, Chair: Prof Andreas Mitschele-Thiel, Ilmenau University of Technology.

Distributed Inter-Cell Interference Coordination,
Chia-Hao Yu, Olav Tirkkonen, Helsinki University of Technology, Finland.

Dynamic Radio Configuration of Self-Organizing Base Stations,
Henning Sanneck, Nokia Siemens Networks, Germany.
Yves Bouwen, Eddy Troch, Devoteam NV/SA, Belgium.

Fault-Tolerant Averaging for Self-Organizing Synchronization in Wireless Ad Hoc Networks,
Robert Leidenfrost, Elektrobit Austria GmbH
Wilfried Elmenreich, Christian Bettstetter, University of Klagenfurt, Austria.

Influence of Information Aging in Self Organizing Joint Radio Resource Management Systems,
Andreas Pillekeit, University of Duisburg Essen, Germany.

Self-Organization in 4G Mobile Networks: Motivation and Vision,
Ulrich Barth, Edgar Kühn, Alcatel-Lucent Bell Labs, Germany.

Wednesday, 22nd September, 10:00 – 12:10

a) Poster 3 – Wireless Systems, Theory and Applications

Concourse area, Chair: Dr Didier Le Ruyet, CNAM

Novel Expressions for the Marcum and One Dimensional Q-functions,
Paschalis C. Sofotasios, Steven Freear, University of Leeds, UK.

The Error-resilient Compression of Correlated Binary Sources and EXIT Chart Based Performance Evaluation,
Yinan Qi, Reza Hoshyar, Rahim Tafazolli, University of Surrey, UK.

A New Signal Detection Scheme Based on Free Probability Theory for Multiple-Input Multiple-Output Cognitive Radio Systems,
Lina Jin, Zhirun Hu, University of Manchester, UK.
XuanYe Gu, British Telecommunications plc, UK.

Aggregate Interference in White Spaces,
Alberto Rabbachin, Gianmarco Baldini, Joint Research Centre (European Commission), Italy.
Tony Q.S. Quek, Institute for Infocomm Research, Singapore.

Three Dimensional Channel Characterization for Low Altitude Aerial Vehicles,
Kai Daniel, Markus Putzke, Bjoern Dusza, Christian Wietfeld, TU Dortmund University, Germany.

Maximum Likelihood Approach to Classification of Digitally Frequency-Modulated Signals,
Meisam Rakhshanfar, Concordia University, Canada.
Mehdi Teimouri, University of Tehran, Iran.

Tracking a LED Array Transmitter for Visible Light Communications on Driving Situation,
Toru Nagura, Takaya Yamazato, Masaaki Katayama, Tomohiro ENDO, Nagoya University, Japan.
Toshiaki FUJII, Tokyo Institute of Technology, Japan.
Hiraku Okada, Saitama University, Japan.

User-Detectable Sequences for the Collision Channel Without Feedback,
Yijin Zhang, Kenneth W. Shum, Wing Shing Wong, The Chinese University of Hong Kong, PR. China.

Improving link reliability complexity trade-off by exploiting reliable feedback signalling,
Mohamed A. M. Hassanien, Pavel Loskot, Swansea University, UK.

Micro-Doppler Extraction from Ballistic Missile Radar Returns Using Time-Frequency Analysis,
Lihua Liu, National University of Defense Technology, China.
D. C. McLernon, Mounir Ghogho, University of Leeds, UK.
Weidong Hu, National University of Defense Technology, China.

On the Optimum Joint Decoding Capacity of Wyner Circular GCMAC by Exploiting Hadamard Inequality,
M Zeeshan Shakir, Tariq S Durrani, University of Strathclyde, UK.
Mohamed-Slim Alouini, King Abdullah University of Science & Technology (KAUST), Saudi Arabia.

Adaptive Minimum Bit Error Rate Receiver for CDMA-Based Block Transmission Systems (Invited Paper),
Cesar A. Medina, Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Brazil.
Tiago T.V. Vinhoza, University of Porto, Portugal.
Raimundo Sampaio-Neto, Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Brazil.

b) Poster 3 –Wireless Networks and Applications

Concourse area, Chair: Tim Tozer, University of York

Experimental Measurements for VoIP with Network Coding in IEEE 802.11,
Iban Lopetegui, Rolando Carrasco, Said Boussakta, University of Newcastle, UK.

Evaluation of Transport Protocols for SIP Signaling over IPv6 DVB-RCS Satellite Networks,
Muhammad Ali, Lei Liang, Zhili Sun, Haitham Cruickshank, University of Surrey, UK.

Evaluation of Interference Avoidance Method using a Tunable Notch Filter for Impulse Radio UWB (IR-UWB) Systems,
Kenichi Takizawa, Yasuhisa Yamamoto, Keren Li, National Institute of Information and Communications Technology (NICT), Japan.

Supporting Patient Monitoring using Activity Recognition with a Smartphone,
Sian Lun Lau, Immanuel König, Klaus David, University of Kassel, Germany.
Baback Parandian, Christine Carius-Düssel, Martin Schultz, Telemedicine Center Charité (TMCC), Germany.

Classification of Digitally Modulated Signals in Presence of Non-Gaussian HF Noise,
Alharbi Hazza, King Saud University, Saudi Arabia.
Mobien Shoaib, Prince Sultan Advanced Technologies Research Institute/STC-Chair, Saudi Arabia.
Saleh Alshebeili, Alturki Fahd, King Saud University, Saudi Arabia.

RF Fingerprint Detection in a Wireless Multipath Channel,

Irwin O. Kennedy, Bell Labs Ireland, Alcatel-Lucent, Republic of Ireland.

Alexandr M. Kuzminskiy, Bell Labs, Alcatel-Lucent, UK.

Interference Robustness Measurements for IEEE 802.16e mobile WiMAX Systems,

Bjoern Dusza, Christian Wietfeld, Dortmund University of Technology, Germany.

WiMAX 54Mbit/s over Radio over Fiber Using DCF, SMF fiber and FGB for Fiber over 410 Km,

Mazin Al Noor, Brunel University, UK.

Jonathan Loo, Middlesex University, UK.

Energy Threshold Adaptation Algorithm on Image Compression to Prolong WSN Lifetime,

Phat Nguyen Huu, Vinh Tran-Quang, Takumi Miyoshi, Shibaura Institute of Technology, Japan.

Wednesday, 22nd September, 10:30 – 12:10

a) Error-Control Coding and Iterative Processing

Room P/L002, Chair: Prof Weiler Finamore, CETUC-PUC-RIO.

Performance Simulation and Analysis of Alternative Automatic Link Establishment (ALE) and Link-16/JTIDS Waveforms with Reed Solomon Encoding and Hybrid Soft Decision-Hard Decision Decoding,

Konstantinos Spyridis, Clark Robertson, Naval Postgraduate School, USA.

Iterative Receivers with Joint Channel and Frequency Offset Estimation in Time-Variant Fading Channels,

Rami Khal, Yuriy Zakharov, University of York, UK.

Performance Analysis of low Complexity Soft Detection for BICM MIMO System,

Rizwan Ghaffar, Raymond Knopp, Institute Eurecom, France.

Switched Interleaving Turbo Codes with Transmission of Side Information for Short Blocks,

Rui Fa, Rodrigo de Lamare, University of York, UK.

Multi Core Implementation of a Trellis Based Syndrome Decoder with Adaptive Complexity,

Klaus Hueske, Jan Geldmacher, Jürgen Götze, TU Dortmund University, Germany.

b) Short Range Communications and Sensor Networks

Room P/T007, Chair: James Harbin, University of York

Optimisation of Mobile Indoor Infrared Systems through Genetic Algorithms,

Mohammad Nikkar Esfahani, Jaafar M. H. Elmirghani, University of Leeds, UK.

Circuit Aware Design of Power-Efficient Short Range Communication Systems,

Amine Mezghani, Nesrine Damak, Josef A. Nossek, Munich University of Technology, Germany.

Combined Spatial-Polarization Correlation Function for Indoor Multipath Environments,

Vahid Dehghanian, John Nielsen, Gerard Lachapelle, University of Calgary, Canada.

Connectivity Analysis in Power Controlled Decentralized Wireless Networks,

Alberto Zanella, IEIIT - CNR, Italy.

Barbara Masini, WiLab, IEIIT- CNR, University of Bologna, Italy.

Fast Distributed Detection, Localization, and Estimation of a Diffusive Target in Wireless Sensor Networks,
Sami Aldalahmeh, Mounir Ghogho, Ananthram Swami, U.S. Army Research Laboratory, USA.

c) Wireless Sensor Networks III

Room P/L001, Chair: Dr Andreas Mitschele-Thiel, Ilmenau University of Technology

Simple Estimation Method of Radio Propagation in Implantable Body Area Networks using CT images,
Kenichi Takizawa, Kiyoshi Hamaguchi, National Institute of Information and Communications Technology (NICT), Japan.

Energy-Aware Channel Selection for Cognitive Wireless Sensor Networks,
Luca Stabellini, Royal Institute of Technology (KTH), Sweden.

Analysis and Extension of Benenson's Robust User Authentication Scheme,
Wolfgang Meyer zu Bergsten, Rudolf Mathar, RWTH Aachen University, Germany.

Receiver based Interference Protection for MAC Protocol in WSNs,
Jian Qiu, Paul D. Mitchell, David Grace, University of York, UK.

A New MAC solution for Multi-Channel Single Radio in Wireless Sensor Networks,
Carlene Campbell, Jonathan Loo, Richard Comley, Middlesex University, UK.

Wednesday, 22nd, September, 14:00 – 15:00

Panel Session: 'The Future for Wireless Communications'

Room P/X001, Chair: Tim Tozer, University of York

Panel Members: Dr Chris Williams, DSTL; Prof Tor Aulin, Chalmers University of Technology; Prof Victor Leung, University of British Columbia, Dr Justin Coon, Toshiba Research Europe Ltd.

Wednesday, 22nd September, 15:00 – 16:40

a) Adaptive Modulation and Interference Mitigation

Room P/L002, Chair: Prof. Raimundo Sampaio-Neto, CETUC-PUC-RIO

A Generalized Subcarrier-Grouped MMSE Based Multi-stage Interference Cancellation Scheme for OFDMA Uplink Systems with CFOs,
Rui Fa, Li Zhang, University of Leeds, UK.

Reduction of intermodulation products of superior order generated by nonlinear systems over OFDM signals using a pre-distortion technique,
Dick Carrillo, UNMSM, PUC-Rio, IndT, Peru.

Reducing the Peak to Average Power Ratio of LDS-OFDM Signals,
Mohammed AL-Imari, Reza Hoshyar, University of Surrey, UK.

Generalised link-layer adaptation with higher-layer criteria for energy-constrained and energy-sufficient data terminals,
Virgilio Rodriguez, Rudolf Mathar, RWTH Aachen University, Germany.

Reducing the Number of Signaling Points Keeping Capacity and Cutoff Rate High,
Anke Schmeink, Haoqing Zhang, Rudolf Mathar, RWTH Aachen University, Germany.

b) Equalization, Synchronization and Channel Estimation

Room P/T007, Chair: Prof Paulo Diniz, Federal University of Rio de Janeiro

A Novel Receiver-Receiver Time Synchronization Scheme for Femtocells,
Jinlin Peng, Li Zhang, D. C. McLernon, University of Leeds, UK.
Jibo Wei, National University of Defense Technology, China.

An alternative Multiple Access Scheme for the uplink 3GPP/LTE based on OFDM/OQAM,
Mohamed Gharba, Rodolphe Legouable, Pierre Siohan, Orange Labs, France.

Sensitivity of Channel Estimation using B-splines to Mismatched Doppler Frequency,
Junruo Zhang, Rami Khal, Yuriy Zakharov, University of York, UK.

Timing Synchronization for OFDM Based Spectrum Sharing System,
Pengfei Sun, Li Zhang, University of Leeds, UK.

A Channel Estimation Method for MIMO-OFDM Mobile WiMax Systems,
Fabien Delestre, Yichuang Sun, University of Hertfordshire, UK.

c) Spectrum Sensing

Room P/L001, Chair: Prof Olav Tirkkonen, Aalto University School of Science and Technology

Spectrum Sensing with Gaussian Approximated Eigenvalue Ratio Based Detection,
Lu Wei, Aalto University, Finland.
Olav Tirkkonen, Helsinki University of Technology, Finland.

Outlier Detection Methods of Low SNR Nodes for Cooperative Spectrum Sensing,
Hung Vu Le, Mai Ohta, Kei Inage, Takeo Fujii, University of Electro-Communications, Japan.
Kazushi Muraoka, Masayuki Ariyoshi, NEC Corporation, Japan.

A Spectrum Sensing Algorithm Based on Random Matrix Theory in Cognitive Radio Networks,
Yigang Zhou, Fei Tian, Harbin Institute of Technology, PR. China.

Distributed and Directional Spectrum Occupancy Measurements in the 2.4 GHz ISM band,
Marja Matinmikko, Miia Mustonen, Marko Höyhtyä, Tapio Rauma, Heli Sarvanko, Aarne Mämmelä, VTT Technical Research Centre of Finland.

Energy-Aware Exploitation of White Spaces in the Time Domain for Wireless Sensor Networks,
Luca Stabellini, Royal Institute of Technology (KTH), Sweden.

Detailed Technical Programme for WUN COGCOM 2010 Workshop

Wednesday, 22nd September, 09:00 – 10:00

Workshop Opening

Room P/L005, Chair: TBC

Introduction to WUN Cognitive Communications Consortium,
David Grace, University of York, UK.

Multi-Class Classification of Analog and Digital Signals in Cognitive Radios using Support Vector Machines (Invited Paper) ,

Marina Petrova, Petri Mähönen, Alfredo Osuna, RWTH Aachen University, Germany.

An Energy Spreading Technique for Cognitive Radio Networks (Invited Paper),

Conor Rochford, Michael Ghizzoni, Matthew Kelley, Richard F. Vaz, Alexander M. Wyglinski,
Worcester Polytechnic Institute, USA.

Michael Barry, Sean McGrath, University of Limerick, Ireland.

Wednesday, 22nd September, 10:30 – 12:10

Dynamic Spectrum Access/Management

Room P/L005, Chair: TBC

A Two-Step Resource Allocation in Multiuser OFDM-based Cognitive Radio Systems,

Xu Mao, Pengbo Si, Beijing University of Technology, China.

Hong Ji, Beijing University of Posts and Telecommunications, China.

Victor C. M. Leung, University of British Columbia, Canada.

Cognitive Radio for UWB Spectrum Sharing and Power Allocation,

Ruofan Jin, David Grace, Paul D. Mitchell, University of York, UK.

Spectrum Efficiency Optimization in Multiuser Ultra Wideband Cognitive Radio Networks,

Liaoyuan.Zeng, Wireless Access Research Center, University of Limerick, Ireland.

Sean McGrath, University of Limerick, Ireland .

Generalized Location-Based Resource Allocation for OFDMA Cognitive Radio Systems,

Mahdi Ben Ghorbel, King Abdullah University of Science and Technology (KAUST), Saudi Arabia.

Haewoon Nam, Motorola Inc, USA.

Mohamed-Slim Alouini, KAUST, Saudi Arabia.

A Framework for Routing and Channel allocation in Cognitive Wireless Mesh Networks,

Reza Mossanen Amini, University of Quebec, Canada.

Zbigniew Dziong, Ecole de Technologie Supérieure, Canada.

Wednesday, 22nd September, 14:00 – 15:00

Workshop Panel Session: ‘The Role of Embedded Intelligence in Cognitive Communications’

Room P/L005, Chair: TBC

Panel Members: TBC

Wednesday, 22nd September, 15:00 – 16:40

Realisation of Cognitive Radio Networks

Room P/L005, Chair: TBC

CORAL: A WiFi Based Cognitive Radio Development Platform (Invited Paper),
John Sydor, Communications Research Centre, Canada.

Cognitive Radio Test-bed Based on ECMA-392 International Standard,
Antony Franklin, JinSuk Pak, Hoiyoon Jung, Sang-Won Kim, Sung-Jin You, Jung-Sun Um, Sunmin Lim, Gwangzeen Ko, SungHyun Hwang, Byung Jang Jeong, Myung Sun Song, Chang-Joo Kim, Electronics and Telecommunications Research Institute (ETRI), Korea.

A Cognitive Radio Realization Based on a Petri Net Approach,
Christian Kocks, Alexander Viessmann, Andreas Waadt, Guido H. Bruck, Peter Jung, University of Duisburg-Essen, Germany.

Spectrum Handoff Reduction for Cognitive Radio Ad Hoc Networks,
Mohamed Abdrabou Ahmed Kalil, Ilmenau University of Technology, Germany.
Hassan Al-Mahdi, Suez Canal University, Egypt.
Andreas Mitschele-Thiel, Ilmenau University of Technology, Germany.

Achieving Fairness in Distributed Cognitive Radio Networks Using a Timer Mechanism,
Alireza Attar, University of British Columbia, Canada.
Natasha Devroye, University of Illinois at Chicago, USA.
Haoming Li, Victor C. M. Leung, University of British Columbia, Canada.

Wednesday, 22nd September, 17:00 – 18:40

Cognitive Multiple Access and Physical Layers

Room P/L005, Chair: TBC

Cognitive Radio Multiple Access Control for Unlicensed and Open Spectrum with Reduced Spectrum Sensing Requirements,
Haibin Li, David Grace, Paul D. Mitchell, University of York, UK.

Fast Frequency-Hopping Dynamic Multiple-Access for Cognitive Radios: Noncoherent Interference Cancellation,
Shuo Zhang, Lie-Liang Yang, University of Southampton, UK.
Youguang Zhang, Beihang University, China

Distributed Selection of Sensing Nodes in Cognitive Radio Networks,
Oktay Ureten, Kareem Emile Baddour, Tricia Willink, Communications Research Centre, Canada.

Channel and Power Allocation in Cognitive Radio Networks,
Zhuo Wu, Yue Fei, Shanghai University, China.

On the Capacity of Cognitive Radio Under Limited Channel State Information,
Zouheir Rezki, King Abdullah University of Science and Technology (KAUST), Saudi Arabia.
Mohamed-Slim Alouini, KAUST, Saudi Arabia.

ISWCS 2010 Visitor Information

About York

The University of York is situated in one the most beautiful cities in Europe (voted European Tourism City of the Year in 2007). Midway between the capital cities of London and Edinburgh, and with excellent transport links, the city has a 2000 year history, and a modern outlook with the Science City York project encouraging high-technology industry, including the University spin-out companies housed at our Science Park. In the last ten years, over 80 technology companies have started or moved here, creating over 2,500 new jobs.



Location

York is situated in the north of England and is the ancient capital of this part of the island of Great Britain. It lies at the confluence of the River Ouse and the River Foss, in the centre of a large plain known as the Vale of York. It is surrounded by areas of outstanding natural beauty, including the North York Coastline, and the Yorkshire Dales and the North York Moors National Parks. London is less than two hours away by train.

History and Architecture



The city (then named Eboracum) was founded by the Romans at the confluence of the Rivers Ouse and Foss, a naturally defensible position. It has always been an important centre: it was one of the capitals of Roman Britain, and for a short period the entire Roman Empire was governed from York. In the ninth century CE, the city (then called Jorvik) was made the capital of most of northern England by the Vikings, and remained so for most of the next eight hundred years.

Amongst the unique features of our city are the well-preserved medieval walls, the unique Jorvik centre, and York Minster, one of the great cathedrals of Europe, and the largest Gothic building in Europe north of the Alps.

Particularly famed for its stained glass windows, it also boasts what is possibly the oldest police force in the world. Also, uniquely for a building completed in 1472, it contains a roof boss designed to commemorate the 1969 landing of the astronauts on the moon: one of a number of features inspired by modern events to replace older bosses destroyed by fire in 1984. It is a peaceful place, open to all, and the building and its gardens provide a quiet haven in a busy city centre.



Largely untouched by the industrial revolution, the centre of York today retains many period buildings, cobbled streets and pedestrian-only areas, lined with cafes and speciality shops.

Tourism is now a major industry, and York is now the second most-visited city in England (after London).

The city is also home to two world-famous museums: the Castle Museum and the National Railway Museum (the largest museum in the world dedicated to railways).

Music and Arts

York is host to the National Centre for Early Music, and hosts an annual Early Music Festival (and also the York Late Music Festival, set up to showcase the work of contemporary composers). The National Centre is hosted in a converted church, and also regularly hosts concerts by University groups, including our own Music Technology students.

The University is home to the oldest legal independent radio station in the United Kingdom, University Radio York, using some equipment maintained and built by electronics students.

Amongst the theatres in the city are the Joseph Rowntree theatre, the Grand Opera House, and the Theatre Royal, home to the annual Theatre Royal Pantomime - a unique theatrical event not to be missed if you're in York over the winter.

ISWCS 2010 Events

Welcome Reception

Sunday 19th September, 18:00 – 20:00

Roger Kirk Centre, University of York
Heslington, York, North Yorkshire
YO10 5DD
Porter Tel: +44 (0)1904 432080

Campus Map:



Ghost Walk,

Monday 20th September, 20.00 -

Exhibition Square (by the fountains), York.

Gala Dinner at the National Railway Museum,

Tuesday 21st September, 19:30 -

Leeman Road, York, YO26 4XJ, Tel: +44 (0)8448 153139.

York Brewery Tour,

Wednesday 22nd September, 19.30 and 20.00

12 Toft Green, York, YO1 6JT, Tel: +44 (0)1904 621162.



ISWCS 2010 & WUN COGCOM 2010 Map

