

IEEE SYMPOSIUM ON NEW FRONTIERS IN DYNAMIC SPECTRUM ACCESS NETWORKS



FINAL PROGRAM

Millennium Knickerbocker Hotel
Chicago, Illinois
14-17 October 2008



www.ieee-dyspan.org/2008



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PROGRAM AT A GLANCE

Tuesday, 14 October 2008

08:30 – 12:00	AM Tutorials
13:00 – 16:30	PM Tutorials and Demonstrations
18:00 – 20:30	Welcome Reception

Wednesday, 15 October 2008

08:30 – 12:00	General Session – Opening Keynote
10:00 – 13:00	Demonstrations
13:00 – 15:00	Technology & Policy Tracks
14:00 – 17:00	Demonstrations & Poster Sessions
15:00 – 15:30	Networking Break
15:30 – 18:00	Technology & Policy Tracks
17:00 – 18:00	Happy Hour Demonstrations and Posters
18:30 – 21:00	Conference Banquet

Thursday, 16 October 2008

08:30 – 12:00	General Session
10:00 – 13:00	Demonstrations
13:00 – 15:00	Technology & Policy Tracks
14:00 – 17:00	Demonstrations & Poster Sessions
15:00 – 15:30	Networking Break
15:30 – 18:00	Technology & Policy Tracks
17:00 – 18:30	Happy Hour Demonstrations and Posters

Friday, 17 October 2008

08:30 – 12:00	General Closing Sessions
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Greetings and Welcome to IEEE DySPAN 2008!



Joe Evans



Dennis Roberson

On behalf of the IEEE DySPAN 2008 Organizing Committee, we would like to welcome you to the 3rd International Dynamic Spectrum Access Networks (DySPAN) symposium. After the success of IEEE DySPAN 2005 in Baltimore and IEEE DySPAN 2007 in Dublin, the conference has firmly established itself as the premier forum for the discussion of all aspects of devices and networks that utilize spectrum on a dynamic basis. IEEE DySPAN 2008 aims to further build on this success and bring to the forefront new cutting-edge research in the technology, policy, economic and legal dimensions of dynamic, decentralized access to the radio spectrum both on a consensual and non-consensual basis.

Dynamic Spectrum Access Networks are rapidly emerging as the natural confluence of a variety of major trends including:

1. All easily usable spectrum is now allocated and in many case to more than one application, but in most cases, it is still not heavily used;
2. New applications, providing enormous benefits and pleasure to humankind is driving ever increasing demand for more spectrum;
3. Existing and new applications are being ever more widely deployed;
4. The demand for more data carrying capacity and data transmission performance is almost insatiable;
5. Hardware and software technology is enabling ever more complex policies and functionality especially supported by wide band frequency agile radios, software defined radio technology, and high speed, low power and low cost processing capabilities;
6. Sophisticated government spectrum sharing policies and related legal regimes are beginning to appear; and
7. Micro-economic theories and practices that support dynamic spectrum pricing models are being developed.

For IEEE DySPAN 2008, we have assembled numerous experts representing the wireless industry and government dedicated to advancing both cutting edge technical and multidisciplinary research as well as practical experience related to building a healthy industry/regulatory ecosystem for the commercialization of smart radio system technologies. These experts will deliver exciting and thought-provoking keynote addresses and technical presentations, comprised of technology and policy tracks including panels and poster sessions. In addition to the technical program, we also have a full day of tutorials presented by top industry and academic scholars and three days of live demonstrations by world-leading technology companies and academic research institutions focusing on smart wireless and dynamic spectrum access systems.

Such a comprehensive, high-quality program is not possible without the hard work and devotion of a very large number of individuals. We would like to extend our deepest appreciation to the keynote speakers, tutorial and demonstration presenters, as well as the entire technical program committee and organizing committees. Finally, we would like to express our sincere thanks to the authors all around the world for their quality contributions, which resulted in an outstanding technical program.

Since IEEE DySPAN only occurs every 18 months, we encourage you to make the most out of the conference and attend as many sessions and events as possible. We hope that the value you, the attendee, get from this conference will be substantial and will further accelerate technical progress in all related areas to dynamic spectrum access.

Joe Evans and Dennis Roberson
General Co-Chairs
IEEE DySPAN 2008

MESSAGE FROM THE TECHNICAL PROGRAM CO-CHAIRS



Preston Marshall



Milind Buddhikot

The IEEE DySPAN event was conceived to bring together experts from technology, policy, economics and legal domain to discuss diverse aspects of effectively and efficiently using valuable radio spectrum. IEEE DySPAN 2008, now the third installment of this event, mirrors the world-wide growth in research in these topics. We are happy to report that the "intent-to-submit" phase recorded 270 abstracts and resulted in 202 final valid submissions. This represented a phenomenal growth of at least 35% in the number of submissions from the last event.

The technical program committee (TPC) we put together consisted of 62 well-known leaders from all parts of the world. This committee collected well over 600 reviews for the received submissions and discussed them in a day-long meeting on 7 August 2008 in Washington, DC. We selected 54 high quality technical papers that span the broad range of topics in DSA and cognitive networks to form the core technical program of the conference covering 2.5 days. We also selected 22 short papers that will be presented in the

interactive poster sessions. This year, we have also given paper presenters the opportunity to participate in poster sessions to benefit from the increased interaction in these sessions.

We would like to take this opportunity to thank all the authors for submitting high quality research manuscripts to IEEE DySPAN 2008. Our special thanks go to our dedicated technical program committee members and numerous reviewers who invested their valuable time in evaluating the submitted manuscripts and in creating the fantastic technical program. We hope that all of the participants of IEEE DySPAN 2008 will enjoy this program as well as the other conference events and the city of Chicago!

Preston Marshall and Milind Buddhikot
Technical Program Co-Chairs
IEEE DySPAN 2008

MESSAGE FROM THE POLICY PROGRAM CO-CHAIRS



Bill Lehr



Steve Sharkey



Julius Knapp

The growth of wireless services of all types necessitates transitioning to a future in which spectrum is shared much more intensively than is possible today. This is the challenge that Dynamic Spectrum Access (DSA) technologies seek to address. The successful commercialization of DSA technologies such as cognitive radio has the potential to remap the global wireless ecosystem, promising expanded capabilities and opportunities for all stakeholders. New products and services, new business/service models, and new spectrum management frameworks are needed to safely accommodate DSA into the wireless landscape.

The IEEE DySPAN conference offers a unique opportunity and forum for addressing the inherently multidisciplinary research

challenge of commercializing DSA. For this conference, the IEEE research community is actively engaging non-engineers to address the important business and policy issues that are integral to further progress in the commercialization of next generation wireless systems. Since the first IEEE DySPAN in 2005, substantial progress has been made from research concepts to prototype demonstrations to early commercialization efforts. The policy program co-chairs and committee are proud to once again have the opportunity to help promote and present relevant policy/economic research to help bridge the disciplinary divides, offering technically-informed policy perspectives and policy-aware commentary on technical issues. With panels on such topics as the white space access in the TV bands and research sessions on the regulatory agenda for DSA policy and the use of DSA by the public safety community, we have sought to present a sampling of the many business/economic/public policy issues that need to be addressed.

As policy co-chairs representing the multidisciplinary flavor of the conference, we would like to thank the IEEE, our colleagues on the IEEE DySPAN organizing committees, our corporate sponsors, and all of the participants joining us in Chicago for providing a forum for building a global cross-disciplinary research community.

Bill Lehr, Steve Sharkey, and Julius Knapp
Policy Program Co-Chairs
IEEE DySPAN 2008

WEDNESDAY, 15 OCTOBER 2008

Morning Keynote Speaker



Dr. Gee Rittenhouse
Vice President
Wireless Research, Alcatel-Lucent Bell Labs

Gee Rittenhouse is Vice President of Bell Labs' Technology Integration Group. This group has a primary mission of taking Bell Labs research assets and innovations and driving them, through development activities and project management, into Alcatel-Lucent products and services. In this position, Gee is closely connected with all of Alcatel-Lucent's

business divisions, interlocking their needs and strategies with Bell Labs' research activities, priorities, and innovations areas.

Prior to heading up the newly formed Technology Integration group, Gee was Vice President, Bell Labs Wireless Research. He received his Bachelor of Science degree in physics from the University of California, Los Angeles in 1986. Then in 1993, he received his Master of Science and Ph.D. degrees in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology. He joined Bell Laboratories as a member of technical staff in 1993 where he worked on high-speed circuits using X-ray lithography for optical networking applications. He later joined the Wireless Research Laboratory at Bell Laboratories where his research focused on RF front-end radio architectures and cellular system engineering. In 2000, he was promoted to Director of the Wireless Technology Research Department and led several projects including MIMO system development, cellular network optimization, wireless IP networks, and fourth generation wireless systems. In 2002 he received the Bell Labs Fellow award. He has numerous publications and patents in the areas of wireless systems and circuits.

WEDNESDAY, 15 OCTOBER 2008

Morning Keynote Speaker



Hardik Bhatt
Chief information Officer of the City of Chicago

In February 2006, Mayor Richard M. Daley appointed Hardik Bhatt as Chief information Officer of the City of Chicago. He also serves as Commissioner of the Department of Business and Information Services (BIS), the municipal agency responsible for meeting the technology needs of 37,000 employees in 46 City departments.

Under Hardik's tenure, BIS has become a major center within city government for innovation and private sector partnerships. He is leading the creation of the Community Wireless Broadband Network, a project that will leverage private partnerships to provide affordable high speed Internet access to all Chicago residents, businesses and community organizations.

Through his leadership, the department has initiated numerous innovations to enhance the citizen - government interaction and allow city departments to function more efficiently. Chicago's 3-1-1 system allows citizens to request city services quickly and easily. Chicago residents can apply for a municipal job through the web, pay parking tickets online, and request a City service or report a problem via the City web site or non-emergency 3-1-1 phone number. They can also obtain valuable information online ranging from emergency preparedness updates and restaurant health inspection results to towed vehicle locations.

In addition to encouraging the use of technology in municipal government, Hardik is an equally active advocate for the development of Chicago's technology community as a whole. He serves as co-chair of the Mayor's Council of Technology Advisors, a group of private and public sector leaders focused on creating digital excellence, building the information technology workforce, and fostering technology-based economic development in Chicago. He is also a member of the Mayor's Advisory Council on Bridging the Digital Divide, created to help the City take the lead in bringing the benefits of technology to all of its residents. Hardik is a frequent promoter of Chicago at technology conferences in America and abroad, having recently spoken at events in Los Angeles, Washington and Seoul, South Korea.

A native of India, Hardik has made Chicago his home since he first moved to the United States. Prior to joining the City, he served as a consultant with Oracle Corporation and Tata Consulting Services. He holds a masters degree in business administration from the Kellogg School of Management at Northwestern University and a bachelor of engineering in computer science from Maharaja Sayajirao University in Baroda, India.

WEDNESDAY, 15 OCTOBER 2008

Banquet Speaker



Christopher B. Galvin
Chairman & CEO
Harrison Street Capital LLC

Christopher Galvin is chairman and cofounder of Harrison Street Capital LLC; Chairman of NAVTEQ, a \$4 billion market cap company and leading supplier of global digital mapping databases; and former chairman and CEO of Motorola Inc.

Mr. Galvin is a member of the Bechtel Corporation's Board of Counselors, the Executive Committee of Northwestern University's Board of Trustees; the American Enterprise Institute Board, the Legion D'honneur, Business Council (US), the American Society of Corporate Executives, an Advisor to the City of Tianjin, China and to Hong Kong, an Advisor to the Searle Family Trusts and the Board of the Chicago Council of Global Affairs. Mr. Galvin is a former chairman of the US-China Business Council; a director of the Rand Corporation and a member of the US Department of Defense Science Board.

Mr. Galvin has also co-founded The Galvin Projects in 2004, a virtual global think tank; Harrison Street Real Estate Capital LLC in 2005, a \$200m private equity fund established to invest in the specialty real estate categories of medical office buildings, parking, storage, student housing and senior housing in the US; and Gore Creek Asset Management LLC in 2005, a large capital investment company, utilizing and managing global investment managers. Activities in early stage high technology ventures and the formation of a privately held multi-business conglomerate will be added in the 2007-2008 timeframe.

After serving the company for over 36 years, Mr. Galvin retired from Motorola as chairman and CEO in 2004. In his later years at Motorola, Mr. Galvin successfully led the \$27 billion revenue company through a grueling global restructuring process that reduced its breakeven cost by +25 percentage points over 2.5 years while at the same time investing heavily in new product development including the completion of the innovative design of Motorola's RAZR cellular phone, (a 4-year development program). During Mr. Galvin's tenure as an executive of Motorola and serving in the Office of the CEO, Motorola inspired or enabled the cable modem, the Nextel service, GPS Navigation plus Telematics and was China's largest foreign investor.

THURSDAY, 16 OCTOBER 2008

Morning Keynote Speaker



David Borth
Corporate Vice President and Chief Technology Officer, & Head of Advanced Technology, Standards, and Common Engineering
Motorola Inc.

Abstract:

Cognitive radio has matured rapidly since the term was coined in 1999. By 2009, cognitive operation in the US television white space (TVWS) is expected to be enabled

through FCC regulation. This is just the first of many potential cognitive wireless system opportunities that will connect underserved markets, enhance public communication, and affect everyday life. A vision of the current and future cognitive radio systems will be presented, with the role of key enabling technologies, such as geo-location databases and cooperative sensing.

Biography:

Dr. David Borth is Corporate Vice President and Chief Technology Officer for the Government and Public Safety business of Motorola Inc. He also is the director of Advanced Technology, Standards and Common Engineering within this business. In this role, he is currently responsible for a number of activities including software-defined radio, cognitive radio, the IC platform for all portable devices and the next generation architecture for future public safety systems. Dr. Borth joined Motorola in 1980 as a member of the Corporate R&D organization in Schaumburg, IL. He became the manager of the Communication Systems Research Laboratory in 1990 and led the Wireless Access Research Center of Excellence within Motorola Labs until August 2005. In September 2005 he was appointed to his current position. For the past 27 years, he has made significant contributions to numerous wireless and wireline technologies including Motorola's implementations of GSM, TDMA and CDMA digital cellular systems. Most recently he has led the broadband wireless research work focusing on the development of key technologies for future wireless systems including 802.16e/WiMAX, LTE, and 4G systems.

From 2000-2003, he was a member of the Computer Science and Telecommunications Board of the National Research Council. In 2005, he was appointed a member of the FCC's Technological Advisory Council (TAC). In 2006, he was appointed to the US Department of Commerce Spectrum Management Advisory Committee. He also serves as a member of the Telecom Industry Association's Research Division. Dr. Borth is a member of Motorola's Science Advisory Board and has been elected a Dan Noble Fellow, Motorola's highest honorary technical award. He has been issued 31 patents to date and has authored or co-authored chapters of five books in addition to 25 publications. He received the Distinguished Alumnus Award from the University of Illinois Electrical and Computer Engineering Alumni Association. He is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), a member of the National Academy of Engineering, and a Registered Professional Engineer in the State of Illinois. Dr. Borth received his B.S., M.S. and Ph.D. degrees in electrical engineering from the University of Illinois at Urbana-Champaign. Previously, he was a member of the Technical Staff of the Systems Division of Watkins-Johnson Co., Palo Alto, CA and an assistant professor in the School of Electrical Engineering, Georgia Institute of Technology, Atlanta, GA.

THURSDAY, 16 OCTOBER 2008

Morning Keynote Speaker



Paul J. Kolodzy
Kolodzy Consulting

Abstract:
Future Challenges and the Current Role of DySPAN

The intensity of spectrum use and the conflicts between technologies and licensing mechanism will continue to increase. The technology, policy, and business challenges are just now being defined. Licensed and unlicensed

advocates have been very vocal for many years. But the role of time division duplex (TDD), primarily for data/asymmetric services, and frequency division duplex (FDD), primarily for voice/symmetric services, is just now being discussed. The determination what is interference and what is harmful interference is a key policy decision. The business challenges are to how to quantify the value of the spectrum and the services given these policy decisions. This presentation will frame as to what are these new "battlegrounds" and how does DySPAN potentially impact the outcome.

Biography:

Dr. Paul Kolodzy has 20 years of experience in technology development for advanced communications, networking, electronic warfare, and spectrum policy for government, commercial, and academic clients. He is currently a Communications Technology Consultant in Advanced Wireless and Networking Technology based near Washington, DC. He is the cofounder of the IEEE DySPAN conference and chair of the inaugural 2005 conference. He is active in technology development for wireless components and new wireless networks and architectures as well as spectrum policy as impacted by new technology. For commercial clients he is currently doing research and analyses for 700 MHz, TV Whitespace, Advanced Wireless Services – AWS, and the proposed National Broadband Radio Services. Prior to being a consultant, Dr. Kolodzy has been: at Stevens Institute of Technology; during 2002, the Senior Spectrum Policy Advisor at the Federal Communications Commission (FCC) and Director of Spectrum Policy Task Force; Program Manager at the Defense Advanced Projects Agency (DARPA); Director at Sanders, A Lockheed Martin Company; and a Group Leader/Staff Member at MIT Lincoln Laboratory.

FRIDAY, 17 OCTOBER 2008

Morning Keynote Speaker



Jorge Pereira
Principal Scientific Officer
European Commission

Dr. Pereira has been with the European Commission (EC), in what is now the Directorate General Information Society and Media, since 1996. He is currently responsible for Wireless Sensor Networks and Cooperating Objects in the area of Networked Embedded and Control Systems, after being responsible for the areas of Energy Efficiency and Emergency

and Crisis Management. Until 2004, he worked in the area of Mobile and Wireless communications, where he was instrumental in defining the research agenda in the areas of Reconfigurable/ Software Defined Radio Networks and 4G.

He is a member of the EC's Spectrum Inter-service Group, and is an advisor to the European Defence Agency (ESA) on issues relating to Communications in general, and Reconfigurable/Software Defined/Cognitive Radio and Spectrum in particular, as well as distributed Sensing, Monitoring and Control. He is a member of the European Security Research and Innovation Forum.

He is a member of the Advisory Board of John Wiley's Wireless Communications and Mobile Computing Journal, and of the Editorial Board of Kluwer Academic Publishers' Wireless Personal Communications Journal.

He is a Member of the IEEE and of the ACM. He has recently taken up the position of Associate Editor for Mobile Radio, including Vehicular Communications, for the IEEE VTS Magazine. He received the SDR Forum 2003 Industry Achievement Award in recognition of his "outstanding contributions, research and development in the field of SDR."

Dr. Pereira obtained his Ph.D. in Electrical Engineering - Systems from the University of Southern California (USC) in 1993, and his Engineering and M.Sc. degrees in Electrical and Computer Engineering from Instituto Superior Técnico (IST), Lisbon, Portugal in 1983 and 1987, respectively.

From 1993 to 1996, he worked at GTE Labs, Waltham, MA, where he was responsible for the Communications analysis and simulations in the FHWA's National Intelligent Transportation Systems (ITS) Architecture Study. He was also involved in the launch of the first CDPD wireless data system in the San Francisco Bay Area, exploring location-based applications, and in the Force XXI work in the area of bringing broadband to the soldier in the field. From 1991 to 1993, he worked at USC for Caltrans and PATH on Intelligent Vehicle Highway Systems (IVHS), and from 1988 to 1990, he worked at LinCom Corp., Los Angeles, in a NASA project on space-to-space communications, and on synchronization issues. Between 1983 and 1988, he taught at the Department of Electrical and Computer Engineering of Instituto Superior Técnico (IST), Lisbon Technical University, Portugal in the areas of Elettrotechnics and Electrical Measurements, Applied Electronics and Telecommunication Systems, where he became Assistant Professor in 1994.

FRIDAY, 17 OCTOBER 2008

Morning Keynote Speaker



Martin Cooper
Executive Chairman and Co-Founder
Arraycomm & Father of the Cellphone

A pioneer in the wireless communications industry, Martin conceived the first portable cellular phone in 1973 and led the 10-year process of bringing it to market.

During 29 years with Motorola, Martin built and managed both its paging and cellular businesses and served as Corporate Director of Research and Development. Products he introduced have had cumulative sales volume of more than \$80 billion.

Upon leaving Motorola, Martin co-founded Cellular Business Systems, Inc. and led it to dominate the cellular billing industry with a 75 percent market share before selling it to Cincinnati Bell. He has been granted eight patents in the communications field and has been widely published.

Under Martin's leadership since its founding in 1992, ArrayComm, Inc. has grown from a seed-funded startup in San Jose, Calif., into the world leader in smart antenna technology with 400 patents issued or pending worldwide.

Martin received the American Computer Museum's George R. Stibitz Computer and Communications Pioneer Award in 2002, he was an inaugural member of RCR's Wireless Hall of Fame, Red Herring magazine named him one of the Top 10 Entrepreneurs of 2000, and Wireless Systems Design provided him with the 2002 Industry Leader award. He holds a B.S. and an M.S. in Electrical Engineering from Illinois Institute of Technology.

Since the dawn of the wireless age, Martin Cooper has helped to craft the science and business structures shaping our markets, and is uniquely qualified to discuss the role government regulation plays with respect to emerging wireless technologies today.

Tuesday, 14 October 2008 • 08:30 – 12:00 • Meeting Room: Tower East

T1: Experimentation I: Conducting Successful Wireless Experiments and a Survey of Available Platforms

Instructors:

David Taubenheim, Motorola Inc., USA
Jeffrey Reed, Virginia Tech, USA
Richard Rachwalski, Motorola Inc., USA

With the increasing variety and capabilities of radio platforms including programmable systems, there are increasing opportunities to conduct wireless experiments to explore theoretical concepts in the academic community and to rapidly prototype industry products. This tutorial provides an in-depth overview of these available radio and programmable platforms and outlines the key elements for conducting successful experimental wireless projects. To supplement the overview material and practical advice gained through years of experimentation, this tutorial will also feature a review of example projects and available platforms. Two leading practitioners from industry will lead this tutorial.

An afternoon tutorial complements this morning tutorial by providing direct hands-on experience with a programmable platform, the GNU/USRP, for experimentation.

Tuesday, 14 October 2008 • 08:30 – 12:00 • Meeting Room: Tower West & Promenade

T2: Networking Cognitive Radios for Dynamic Spectrum Access

Instructors:

Qing Zhao, UC Davis, USA
Ananthram Swami, Army Research Laboratory, USA

The tutorial will elucidate key issues and challenges, and the state-of-the-art theories and techniques for cognitive radio networks. This tutorial will also cover a number of newly obtained results on the design of opportunistic spectrum access networks within a decision theoretic framework. This tutorial will provide attendees with a critical understanding of the current research and provide linkages between signal processing and networking aspects of Dynamic Spectrum Access (DSA). The tutorial will cover cognitive radio for DSA with both breadth and depth. The tutorial will discuss PHY, MAC and Networking Layer issues in the context of Cognitive Networks.

Tuesday, 14 October 2008 • 13:00 – 16:30 • Meeting Room: Tower East

T3: Experimentation II: Working with Programmable Platforms Including the GNU Radio/USRP

Instructor:

Johnathan Corgan, Corgan Enterprises LLC, USA

This hands-on tutorial provides an opportunity for attendees to learn the key elements for conducting wireless experiments using a programmable platform, specifically the GNU/USRP. Although using the GNU/USRP, this tutorial will show attendees the possibilities in exploiting capabilities of programmable platforms that are applicable to many different systems. Taught by a leading developer of wireless applications, this tutorial will discuss real-world case studies and guide participants through the steps of developing wireless applications leading to end-of-the-day demonstrations. This tutorial does not require previous experience with the GNU/USRP, but general principles of programming and waveform development is expected. A morning tutorial complements this afternoon tutorial by providing an overview of all of the elements necessary for conducting successful wireless experiments and a survey of the many available radio and programmable platforms in addition to the GNU/USRP.

Tuesday, 14 October 2008 • 13:00 – 16:30 • Meeting Room: Tower West & Promenade

T4: Policy & Technology Intersections: Recent Developments in Flexible and Dynamic Spectrum Use

Instructors:

Simon Pike, Vodafone, United Kingdom
Reza Karimi, OfCom, United Kingdom
Jean-Philippe Kermoal, European Radiocommunications Office, Denmark
Andy Gowans, OfCom, United Kingdom

This tutorial will present recent policy developments concerning the flexible and dynamic use of the electromagnetic spectrum with a special focus on the European regulatory and technical framework. The tutorial will present several case studies illustrating important recent developments from the policy, technical, and economic perspectives. One important example is the Wireless Access Policy for Electronic Communications Services (WAPECS) which aims to develop a method to make frequency bands, such as 2.6 GHz and 3.4 GHz, available for fixed, mobile, and broadcasting services. Another important example was the implementation of Dynamic Frequency Selection (DFS) in frequency bands near 5 GHz that enables sharing between wireless access networks and radiolocation systems. There have also been significant advances in unlicensed applications (called licence-exempt in Europe), and in particular techniques for dynamic spectrum sharing with primary services.

Wednesday, 15 October 2008 • 08:30 – 12:00 • Rm: Crystal Room

PLENARY SESSION

Opening Welcome

General Co-Chairs

Joseph B. Evans, University of Kansas, USA
Dennis Roberson, IIT, USA

Keynote Speakers

Dr. Gee Rittenhouse

Vice President, Wireless Research, Alcatel-Lucent Bell Labs, USA
Hardik Bhatt
 Chief Information Officer of the City of Chicago, IL, USA

10:00 – 10:30 • AM Networking Break

10:30 – 12:00

Plenary Policy & Technology Session

Session Chair: Joseph B. Evans, University of Kansas, USA

Plenary Policy 1: Challenges of Commercializing DSA: Business and Policy Perspectives

John Chapin (Vanu, Inc., USA)
 Steve Sharkey (Motorola Inc., USA)

Plenary Technology 1: XG DSA Radio System

Mark McHenry, Karl Steadman, Alexe E. Leu, Ed Melick
 (Shared Spectrum Company, USA)

Plenary Technology 2: Dynamic Spectrum Management of Front End Linearity and Dynamic Range

Preston Marshall (DARPA, USA)

Plenary Technology 3: Listen-Before-Talk vs Treating Interference as Noise for Spectrum Sharing

Ahmed Sadek, Wenyi Zhang, Qualcomm, Stephen Shellhammer
 (Qualcomm, USA)

Wednesday, 15 October 2008 • 13:00 – 15:00 • Rm: Parlor CD

Technology Track Session I, Track I: Spectrum Measurements and Sensing

Session Chair: Alexander Wyglinski, Worcester Polytechnic Institute, USA

Tech 4: Primary Users in Cellular Networks: A Large-scale Measurement Study

Daniel Willkomm (Technische Universität Berlin, Germany)
 Sridhar Machiraju, Jean Bolot (Sprint, USA)
 Adam Wolisz (Technische Universität Berlin, Germany)

Tech 5: Closed-Form Analysis of Spectrum Characteristics for Cognitive Radio Performance Analysis

Preston Marshall (DARPA, USA)

Tech 6: Exploiting Interference Diversity for Event-Based Spectrum Sensing

Arash Parsa, Amin Aminzadeh Gohari, Anant Sahai
 (University of California - Berkeley, USA)

Tech 7: A Spectrum Sensing Technique for Cognitive Radios in the Presence of Harmonic Images

Niels Moseley, Eric Klumperink, Bram Nauta
 (University of Twente, The Netherlands)

Tech 8: A Novel Spectrum-Sensing Method Based on Maximum Cyclic Autocorrelation Selection for Cognitive Radio System

Kazushi Muraoka, Masayuki Ariyoshi (NEC Corporation, Japan)
 Takeo Fujii (The University of Electro-Communications, Japan)

Wednesday, 15 October 2008 • 13:00 – 15:00 • Rm: Parlor AB

Technology Track Session I, Track II: Air Interfaces for DSA Systems

Session Chair: Reza Karimi, OfCom, United Kingdom

Tech 9: A Novel Sidelobe Suppression Technique for OFDM-Based Cognitive Radio Transmission

Srikanth Pagadarai, Alexander Wyglinski (Worcester Polytechnic Institute, USA)
 Rakesh Rajbanshi (Cisco Systems Inc., USA)

Tech 10: Timing Acquisition for Non Contiguous OFDM based Dynamic Spectrum Access

Joydeep Acharya (WINLAB, Rutgers University, USA)
 Harish Viswanathan, Sivarama Venkatesan (Bell Lab, Alcatel-Lucent, USA)

Tech 11: Cognitive Radio Centric Overlay/Underlay Waveform

Vasu Chakravarthy (Air Force Research Laboratory, USA)
 Zhiqiang Wu (Wright State University, USA)
 Michael Temple (Air Force Institute of Technology, USA)
 Fred Garber, Xue Li (Wright State University, USA)

Tech 12: Bandwidth-Adaptive Waveforms for Dynamic Spectrum Access Networks

Paul D. Sutton, Baris Ozgul, Keith E. Nolan, Linda E. Doyle
 (Centre for Telecommunications Value-Chain Research, Ireland)

Wednesday, 15 October 2008 • 13:00 – 15:00 • Rm: Heritage

Policy Track Session I, Track III: Public Safety and Spectrum Management

Session Chair: Steve Sharkey, Motorola Inc., USA

Policy 2: Spectrum Pooling for Next Generation Public Safety Radio Systems

William Lehr (Massachusetts Institute of Technology, USA)
 Nancy Jesuale (NetCity Engineering, USA)

Policy 3: Smart Radios and Collaborative Public Safety Communications

Brad Bernthal (Colorado Law School, USA)
 Nancy Jesuale (NetCity Engineering, USA)

Policy 4: Public Safety and Emergency Case Communications: Opportunities from the Aspect of Cognitive Radio

Ali Gorcin, Huseyin Arslan (University of South Florida, USA)

Wednesday, 15 October 2008 • 15:30 – 18:00 • Rm: Parlor CD

Technology Track Session II, Track I: Spectrum Measurements and Sensing

Session Chairs: Anant Sahai, University of California - Berkeley, USA
Timothy Newman, Virginia Tech, USA

Tech 13: Evaluation of Cooperative Spectrum Sensing based on Large Scale Measurements

Matthias Wellens, Janne Riihijärvi, Martin Gordziel, Petri Mähönen
 (RWTH Aachen University, Germany)

Tech 14: Sensor Selection for Cooperative Spectrum Sensing

Yngve Selén, Hugo Tullberg, Jonas Kronander
 (Ericsson Research, Sweden)

Tech 15: Belief Propagation on Factor Graphs for Cooperative Spectrum Sensing in Cognitive Radio

Sepeideh Zarrin, Teng Joon Lim (University of Toronto, Canada)

Tech 16: Optimal Cooperative Sensing Scheme under Time-varying Channel for Cognitive Radio Networks

Yi Liu, Rong Yu, Shengli Xie (South China University Technology, China)

Tech 17: Fast Discovery of Spectrum Opportunities in Cognitive Radio Networks

Hyoil Kim, Kang Shin (University of Michigan, USA)

Tech 18: Towards Efficient Spectrum Sensing for Cognitive Radio Through Knowledge-Based Reasoning

Xiao Yu Wang, Pin-Han Ho, Alexander Wong
 (University of Waterloo, Canada)

Tech 19: Noise Calibration, Delay Coherence & SNR Walls for Signal Detection
Rahul Tandra, Anant Sahai (University of California - Berkeley, USA)

Tech 20: The Impact of Spectrum Sensing Time on the Performance of the GADIA Algorithm
Behtash Babadi, Vahid Tarokh (Harvard University, USA)

Wednesday, 15 October 2008 • 15:30 – 18:00 • Rm: Parlor AB

Technology Track Session II, Track II: Managed Commons
Session Chairs: Doug Sicker, University of Colorado - Boulder, USA
Xin Liu, University of California – Davis, USA

Tech 21: Security-enhanced Virtual Channel Rendezvous Algorithm for Dynamic Spectrum Access Wireless Networks
Liangping Ma (Argon ST, Inc., USA)
Chien-Chung Shen (University of Delaware, USA)

Tech 22: Hammer Model Threat Assessment of Cognitive Radio Denial of Service Attacks
Amita Sethi, Timothy Brown (University of Colorado - Boulder, USA)

Tech 23: An Analytical Model for Primary User Emulation Attacks in Cognitive Radio Networks
Santhanakrishnan Anand, Zituo Jin, Koduvayur Subbalakshmi (Stevens Institute Technology, USA)

Tech 24: Spectrum Enforcement and Liability Assignment in Cognitive Radio Systems
George Atia (Boston University, USA)
Anant Sahai (University of California - Berkeley, USA)
Venkatesh Saligrama (Boston University, USA)

Tech 25: Detecting Selfish Behavior in a Cooperative Commons
Hyun Jin Kim, Jon M. Peha (Carnegie Mellon University, USA)

Tech 26: Incentives and Resource Sharing in Spectrum Commons
Junjik Bae, Eyal Beigman, Randall Berry, Michael Honig, Rakesh Vohra (Northwestern University, USA)

Tech 27: Sequence-based Rendezvous for Dynamic Spectrum Access
Luiz DaSilva (Virginia Tech, USA)
Igor Guerreiro (Federal University of Ceara, Brazil)

Wednesday, 15 October 2008 • 15:30 – 18:00 • Rm: Heritage

Policy Track Session II, Track III: Spectrum Management and Business Models
Session Chair: William Lehr, MIT, USA

Policy 5: De-situating Spectrum: Rethinking Radio Policy using Non-spatial Metaphors
J Pierre De Vries (University of Colorado - Boulder, USA)

Policy 6: Multi-level Standardization and Business Models for Cognitive Radio: The Case of the Cognitive Pilot Channel
Simon Delaere, Pieter Ballon (IBBT-SMIT, Vrije Universiteit Brussel, Belgium)

Policy 7: Towards a Unified Policy Language for Future Communication Networks: A Process
Mieczyslaw Kokar (Northeastern University, USA)

Donald Hillman (Lehigh University, USA)
Shujun Li (Northeastern University, USA)
Bruce Fette (General Dynamics C4 Systems, USA)
Preston Marshall (DARPA, USA)
Mark Cummings (en Via, USA)
Todd Martin (Science Technology Associates, USA)
John Strassner (Motorola Inc., USA)

Policy 8: Considerations for Successful Cognitive Radio Systems in US TV White Space
Randy Ekl David Borth, Bruce Oberlie (Motorola Inc, USA)

Thursday, 16 October 2008 • 08:30 – 12:00 • Rm: Crystal Room

PLENARY SESSION

Keynote Speakers

David Borth

Corporate Vice President and Chief Technology Officer, & Head of Advanced Technology, Standards, and Common Engineering Motorola Inc., USA

Paul Kolodzy

Kolodzy Consulting, USA

10:00 – 10:30 • AM Networking Break

10:30 – 12:00

Plenary Policy & Technology Session

Session Chair: Victor Bahl, Microsoft, USA

Policy 1: Plenary Policy Talk: TV White Space Policy Status and Challenges
Julius Knapp (FCC, USA)

Tech 1: Models for Analyzing Cognitive Radio Interference to Wireless Microphones in TV Bands
Ramandeep Dhillon, Timothy X Brown (University of Colorado, USA)

Tech 2: Geo-location Database Techniques for Incumbent Protection in the TV White Space
David Gurney, Stephen Kuffner, Gregory Buchwald, John Grosspietsch, Lawrence Ecklund (Motorola Inc., USA)

Tech 3: Cognitive Radio System using IEEE 802.11a over UHF TVWS
Ramandeep Ahuja, Robert Corke (Motorola Inc., USA)

Thursday, 16 October 2008 • 13:00 – 15:00 • Rm: Parlor CD

Technology Track Session I, Track I: Cognitive Networks I

Session Chairs: Ranveer Chandra, Microsoft Research, USA
Petri Mahonen, RWTH, Germany

Tech 4: Determination of Detection Thresholds to Allow Safe Operation of Television Band White Space Devices
Mark McHenry, Karl Steadman, Mark Lofquist (Shared Spectrum Company, USA)

Tech 5: Opportunistic Spectrum Access in Heterogeneous User Environments
Eric Jung, Xin Liu (University of California - Davis, USA)

Tech 6: Load Balancing for Dynamic Spectrum Assignment with Local Information for Secondary Users
Simon Fischer, Petri Mahonen (RWTH Aachen University, Germany)
Marcel Schöngens (ETH Zurich, Switzerland)
Berthold Vöcking (RWTH Aachen University, Germany)

Tech 7: Passive Steady State RF Fingerprinting: A Cognitive Technique for Scalable Deployment of Co-channel Femto Cell Underlays
Irwin Kennedy, Patricia Scanlon (Alcatel-Lucent, Ireland)
Milind Buddhikot (Alcatel-Lucent, USA)

Tech 8: Joint Spectrum and Power Allocation for Inter-Cell Spectrum Sharing in Cognitive Radio Networks
Won-Yeol Lee, Ian F. Akyildiz (Georgia Institute of Technology, USA)

Tech 9: On the Complexity of Minimum Partition of Frequency-Agile Radio Networks
V.S. Anil Kumar, Madhav Marathe (Virginia Tech, USA)
Sriram Pemmaraju, Imran Pirwani (University of Iowa, USA)

Thursday, 16 October 2008 • 13:00 – 15:00 • Rm: Parlor AB

**Technology Track Session I, Track II:
Experimental Systems and Testbeds**

Session Chairs: Dirk Grunwald, University of Colorado - Boulder, USA
Todd Martin, STA Associates, USA

Tech 10: Experimental Field Test Results on Feasibility of Declarative Spectrum Management

Filip Perich, Robert Foster, Peter Tenhula, Mark McHenry
(Shared Spectrum Company, USA)

Tech 11: An Experimental Cognitive Radio for First Responders

Peiman Amini, Ehsan Azarnasab, Pooyan Amini, Salam Akoum,
Behrouz Farhang-Boroujeny (University of Utah, USA)

Tech 12: A Feasibility Study on Software Defined Cognitive Radio Equipment

Hiroshi Harada (NICT, Japan)

Tech 13: Requirements of an Open Platform for Cognitive Networks Experiments

Luiz DaSilva, Allen MacKenzie, Claudio da Silva (Virginia Tech, USA)
Ryan Thomas (Air Force Institute of Technology, USA)

Tech 14: A Parallel Computing Based Spectrum Sensing Approach for Signal Detection under Conditions of Low SNR and Rayleigh Multipath Fading

Feng Ge, Charles W. Bostian (Virginia Tech, USA)

Tech 15: Distributed Coordination Schemes for Multi-Radio Co-existence in Dense Spectrum Environments: An Experimental Study on the ORBIT Testbed

Xiangpeng Jing, Shanmuga Anaraman, Mesut Ali Ergin, Ivan Seskar,
Dipankar Raychaudhuri (WINLAB Rutgers University, USA)

Tech 16: Long-term, Wide-band Spectral Monitoring in Support of Dynamic Spectrum Access Networks at the IIT Spectrum Observatory

Roger B. Bacchus, Antoni J. Fertner, Cynthia S. Hood, Dennis A. Roberson
(Wireless Network and Communication Research Center (WiNCom), Illinois Institute of Technology, USA)

Thursday, 16 October 2008 • 13:00 – 15:00 • Rm: Heritage

Policy Track Session I, Track III: Regulatory Regimes for DSA

Session Chair: Peter Tenhula, Shared Spectrum Company, USA

Policy 2: Impact of DSA on Current Regulatory Regimes

Ahmed Gad, Fadel Digham (National Telecom Regulatory Authority, Egypt)

Policy 3: Radio Spectrum Policy Reform in Developing Countries

Mohamed El-Moghazi, Fadel Digham, Elsayed Azzouz
(National Telecom Regulatory Authority, Egypt)

Policy 4: Dynamic Spectrum Management Policy for Cognitive Radio: An Analysis of Implementation Feasibility Issues

Hyenyoung Yoon, Junseok Hwang
(Seoul National University, Korea)

Policy 5: Employing Market Mechanisms to Manage Spectrum

Mark Bykowsky, William Sharkey (FCC, USA)

Thursday, 16 October 2008 • 15:30 – 18:00 • Rm: Parlor CD

**Joint Technology-Policy Track Session II, Track I:
Spectrum Management: Allocation, Auctions and Games**

Session Chair: Heather Zheng, University of California - Santa Barbara, USA

Policy 6: Licensed or Unlicensed: The Economic Considerations in Incremental Spectrum Allocations

Coleman Bazelon (The Brattle Group, USA)

Tech 17: Physical Interference Driven Dynamic Spectrum Management

Lei Yang, Lili Cao, Haitao Zheng (University of California - Santa Barbara, USA)

Tech 18: Near-Optimal Dynamic Spectrum Allocation in Cellular Networks

Anand Prabhu Subramanian, Mahmoud Al-Ayyoub, Himanshu Gupta,
Samir R. Das (Stony Brook University, USA)
Milind Buddhikot (Alcatel-Lucent, USA)

Thursday, 16 October 2008 • 15:30 – 18:00 • Rm: Parlor AB

**Technology Track Session II, Track II:
Industry Activities and Standards**

Session Chair: David Taubenheim, Motorola Inc., USA

Tech 19: IEEE P1900.4 System Overview on Architecture and Enablers for Optimised Radio and Spectrum Resource Usage

Soodesh Buljore, Vincent Merat (Motorola, France)
Hiroshi Harada, Stanislav Filin (NICT, Japan)
Paul Houze (France Telecom, France)

Kostas Tsagkaris (University of Piraeus, Greece)

Vladimir Ivanov (Intel, Russia)

Klaus Nolte (Alcatel-Lucent, Germany)

Tim Farnham (Toshiba, United Kingdom)

Oliver Holland (King's College London, United Kingdom)

Tech 20: The Design and Operation of the IEEE 802.22.1 Disabling Beacon for the Protection of TV Whitespace Incumbents

Gregory Buchwald, Stephen Kuffner, Monique Brown, Edgar Callaway
Lawrence Ecklund (Motorola Inc., USA)

Tech 21: Standardizing WiMAX Solutions for Coexistence in the 3.65 GHz Band

Kenneth Stanwood (NextWave Wireless, USA)

Paul Piggin (NextWave Wireless, United Kingdom)

Thursday, 16 October 2008 • 15:30 – 18:00 • Rm: Heritage

**Joint Technology-Policy Track Session II, Track III:
Resource Management and QoS**

Session Chair: Rui Zhang, Institute of Infocomm Research, Singapore

Policy 7: Data-Centric Prioritization in a Cognitive Radio Network: a Quality-of-Service based Design and Integration

Urban Wiggins, Rajgopal Kannan (Louisiana State University, USA)

Vasu Chakravarthy (WP Air Force Base, USA)

Athanasios Vasilakos (University of Western Macedonia, Greece)

Tech 22: Delay-Sensitive Resource Management in Multi-hop Cognitive Radio Networks

Hsien-Po Shiang, Mihaela Van der Schaar
(University of California - Los Angeles, USA)

Tech 23: Optimal Bandwidth Selection in Multi-Channel Cognitive Radio Networks: How Much is Too Much?

Dan Xu, Eric Jung, Xin Liu (University of California - Davis, USA)

Panel: "Opportunistic TV White Space Reuse: Facts and Fiction"

Coordinator: Paul Kolodzy, Kolodzy Consulting, USA

Panelists: Charlie Rhodes, Haiyun Tang (Adaptrum, USA)

Michael Calabrese (New America Foundation, USA)

Simon Pike (Vodafone, United Kingdom)

Andy Setos (Fox TV, USA)

SYMPOSIUM PROGRAM

Friday, 17 October 2008 • 08:30 – 12:00 • Rm: Crystal Room

PLENARY SESSION

Closing Remarks

General Co-Chairs

Joseph B. Evans, University of Kansas, USA

Dennis Roberson, IIT, USA

Keynote Speaker

Jorge Pereira

Principal Scientific Officer
European Commission, Belgium

Summary of Demonstrations

Keith Nolan, Trinity College Dublin, Ireland

Tom Rondeau, Trinity College Dublin, Ireland

10:00 – 10:30 • AM Networking Break

10:30 – 12:00

Plenary Policy & Technology Session

Friday, 17 October 2008 • 10:15 – 11:15 • Rm: Crystal Room

Joint Technology-Policy Session II, Track I:

Spectrum Management: Allocation, Auctions and Games

Session Chair: **Ivan Cosovic**, Do CoMo Labs, Germany

Policy 1: Spectrum Markets for Wireless Services

Junjik Bae, Eyal Beigman, Randall Berry, Michael Honig, Hongxia Shen, Rakesh Vohra, Hang Zhou (Northwestern University, USA)

Tech 1: A Multi-Winner Cognitive Spectrum Auction Framework with Collusion-Resistant Mechanisms

Yongle Wu, Beibei Wang, K. J. Ray Liu (University of Maryland, USA)

T. Charles Clancy (US Department of Defense, USA)

Tech 2: A Revenue Enhancing Stackelberg Game for Owners in Opportunistic Spectrum Access

Ali Ercan, Jiwoong Lee, Sofie Pollin, Jan Rabaey
(University of California - Berkeley, USA)

Friday, 17 October 2008 • 10:15 – 11:15 • Rm: Parlor F

Joint Technology-Policy Track Session II, Track III:

Resource Management and QoS

Session Chair: **John Chapin**, Vanu, Inc., USA

Policy 2: Welfare Effects of Spectrum Management Regimes

Ergin Bayrak (University of Southern California, USA)

Tech 3: Environmentally-Friendly Secondary Network Topology Control for Minimizing Outage Potential

Daniel Friend, Allen MacKenzie (Virginia Tech, USA)

Tech 4: A Spectrum-Shaping Perspective on Cognitive Radio

Wenyi Zhang (Qualcomm Inc., USA)

Urbashi Mitra (University of Southern California, USA)

Friday, 17 October 2008 • 11:15 – 12:30 • Rm: Crystal Room

Panel: "Where to from Here?" A Look into the Crystal Ball"

Coordinator: **Douglas Sicker**, University of Colorado – Boulder, USA

Panelists: **Jie Wu** (Florida Atlantic University, USA) (*Invited*)

Preston Marshall (DARPA, USA)

Victor Bahl (Microsoft Research, USA)

William Lehr (MIT, USA)

Julius Knapp (FCC, USA)

Ying-Chang Liang (Institute for Infocomm Research, Singapore)



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HOW DOES THIS HELP YOU?	WHO QUALIFIES?
<p style="margin: 0;">Certified wireless communications engineers...</p> <ul style="list-style-type: none"> • Have more job opportunities • Are eligible for better compensation • Enjoy easier workforce mobility 	<p style="margin: 0;">Wireless communications engineers who...</p> <ul style="list-style-type: none"> • Hold a bachelor's degree from an accredited institution • Have at least three years of wireless engineering experience • Are making a switch to the wireless field

BENEFITS FOR EMPLOYERS

- Reduces the amount of in-house training an organization may need to develop for their engineers, saving them - Time, Money, and Resource Allocations
- Identifies properly skilled and qualified engineers for wireless engineering assignments
- Helps screen potential job candidates / applicants

- The next application and testing period is scheduled for Spring 2009. For exact dates and more information, please see WWW.IEEE-WCET.ORG. -

Meeting Room:
Continental Room

Tuesday, 14 October 2008
13:00 – 16:30

Wednesday, 15 October 2008
10:00 – 13:00
14:00 – 17:00
17:00 – 18:00

Thursday, 16 October 2008
10:00 – 13:00
14:00 – 17:00
17:00 – 18:30

IEEE DySPAN 2008 will provide the opportunity to conduct live demonstrations of dynamic spectrum systems and networks. This year's event will build on the huge success of the demonstrations at IEEE DySPAN 2007 by offering an invaluable opportunity to demonstrate, experiment and interact with other world-leading researchers. This year's demonstrations will feature dynamic spectrum access, cognitive radio, and policy-based systems, prototypes, and critical technology components and algorithms.

In addition to pre-planned demonstrations, unique opportunities exist for experimentation by participants. These opportunities include general measurements of spectral activity during the demonstration and experimentation sessions; the interaction of various, independently-developed systems and networks; and the coexistence of systems using different spectrum adaptation algorithms.

PARTICIPANTS

Adaptrum (USA)

Real-time video transmission over TV white space without interfering with nearby TV sets.

Centre for Telecommunications Value-Chain Research (Ireland)

1. A dynamic spectrum access network using cyclostationary signatures for network formation, network rendezvous and link maintenance.
2. The use of a static single carrier wireless communications link to facilitate transfer of software components to network devices that then reconfigure themselves to establish new communications links employing more advanced waveforms.

Centre for Wireless Telecommunications, Virginia Tech (USA)

1. A heterogeneous cognitive radio network enabling dissimilar cooperative spectrum sensing, dynamic spectrum access, and interoperability.
2. A dynamic cellular cognitive system (DCCS) designed to self-organize cognitive radios and other communication devices and to automatically form a dynamic cellular structured network.

Delft University of Technology (The Netherlands)

A dynamic spectrum access system employing adaptive carrier selection and intelligent spectrum sensing techniques on multiple platforms.

Institute for Infocomm Research (I2R) (Singapore)

A white-space device prototype using a covariance-based signal detection method, which is signal independent and applicable to any signal waveform or system.

Motorola (USA)

A cognitive radio system operating in TV white space UHF spectrum, utilizing geolocation functionality and supporting dynamic channel selection for the avoidance of incumbent (e.g. DTV) users.

OMESH Networks (Canada)

A large-scale cognitive wireless network that opportunistically utilizes network resources including spectrum bandwidth and radio availability to realize reliable wireless communications.

Philips Research (USA)

A prototype dynamic spectrum access system that can quickly and robustly sense spectrum availability, use medium access control (MAC) protocols that allow seamless and autonomous multichannel operation, and provide quality of service (QoS) guarantees in the face of channels becoming unavailable due to the appearance of incumbents.

Rockwell Collins (USA)

A low-power, small-form-factor spectral sensor and robust maximum likelihood classifier algorithm to detect and classify real world signals.

Shared Spectrum Company (USA)

A high-level policy language, policy-based radio control, operation using a small, low cost general purpose processor, and improved building penetration using multi-band operation.

University of South Florida/Anritsu (USA)

Using a tree-based algorithm to detect, evaluate, and identify signals, including information such as bandwidth, center frequency, power level, etc., in addition to statistical information regarding spectrum usage.

Stevens Institute of Technology (USA)

A cognitive radio IEEE 802.11 MAC air-interface called SpiderRadio that can perform spectrum sensing to detect any unused frequency channel in the allowable spectrum bands.

University of Utah (USA)

Reliable detection of white space spectrum using a sensing mechanism with a high spectral dynamic range using embedded, real-time cognition algorithms.

Wednesday, 15 October 2008

Meeting Room: Crystal Ballroom Balcony

14:00 – 17:00 Poster Viewing

17:00 – 18:00 Poster Discussions

PS 1: Multi-antenna Framework for Spectrum Reuse based on Primary-secondary Cooperation

Omar Bakr, Ben Wild, Mark Johnson, Kannan Ramchandran (University of California - Berkeley, USA)

PS 2: A Novel Sidelobe Suppression Technique for OFDM-Based Cognitive Radio Transmission

Srikanth Pagadarai, Alexander Wyglinski (Worcester Polytechnic Institute, USA)
Rakesh Rajbanshi (Cisco Systems Inc., USA)

PS 3: Noise Calibration, Delay Coherence and SNR Walls for Signal Detection

Rahul Tandra, Anant Sahai (University of California - Berkeley, USA)

PS 4: A Revenue Enhancing Stackelberg Game for Owners in Opportunistic Spectrum Access

Ali Ercan, Jiwoong Lee (University of California - Berkeley, USA)
Sofie Pollin (IMEC / University of California - Berkeley, USA)
Jan Rabaey (University of California - Berkeley, USA)

PS 5: An Asynchronous Neighbor Discovery Algorithm for Cognitive Radio Networks

Chanaka Liyana Arachchige, Subbarayan Venkatesan, Neeraj Mittal (University of Texas - Dallas, USA)

PS 6: Noncooperative Equilibrium Solutions for Spectrum Access in Distributed Cognitive Radio Networks

Siva Kupanna Subramani (University of Bristol, United Kingdom)
Tamer Basar (University of Illinois at Urbana-Champaign, USA)
Simon Armour, Dritan Kaleshi (University of Bristol, United Kingdom)
Zhong Fan (Toshiba Research Europe, United Kingdom)

PS 7: Adaptive Antennas and Dynamic Spectrum Management for Femtocellular Networks: A Case Study

Mika Husso, Jyri Hämäläinen, Riku Jantti (Helsinki University of Technology, Finland)
Alexander Wyglinski (Worcester Polytechnic Institute, USA)

PS 8: On Peak versus Average Interference Power Constraints for Protecting Primary User Transmissions in Cognitive Radio Networks

Rui Zhang (Institute of Infocomm Research, Singapore)

PS 9: An Asynchronous Neighbor Discovery Algorithm for Cognitive Radio Networks

Chanaka Liyana Arachchige, Subbarayan Venkatesan, Neeraj Mittal (University of Texas - Dallas, USA)

PS 10: Opportunistic Spectrum Access in Heterogeneous User Environments

Eric Jung, Xin Liu (University of California - Davis, USA)

PS 11: An Experimental Cognitive Radio for First Responders

Peiman Amini, Ehsan Azarnasab, Pooyan Amini, Salam Akoum, Behrouz Farhang-Boroujeni (University of Utah, USA)

PS 12: Optimal Cooperative sensing Scheme under Time-varying Channel for Cognitive Radio Networks

Yi Liu (South China University of Technology, China)
Rong Yu (Tsinghua University, China)
Shengli Xie (South China University of Technology, China)

PS 13: Bandwidth-Adaptive Waveforms for Dynamic Spectrum Access Networks

Paul Sutton (Center for Telecommunications Value-Chain Research, Ireland)
Baris Ozgul, Keith Nolan, Linda Doyle (Trinity College Dublin, Ireland)

PS 14: Parameter Sensitivity in Cognitive Radio Adaptation Engines

Timothy Newman (Virginia Tech, USA)
Joseph Evans (University of Kansas, USA)

PS 15: Channel Allocation & Power Control for Dynamic Spectrum

Cognitive Networks using a Localized Island Genetic Algorithm
Mustafa El-Nainay, Daniel Friend, Allen MacKenzie (Virginia Tech, USA)

PS 16: Passive Steady State RF Fingerprinting: A Cognitive Technique for Scalable Deployment of Co-channel Femto Cell Underlays

Irwin Kennedy, Patricia Scanlon (Alcatel-Lucent, Ireland)
Milind Buddhikot (Alcatel-Lucent, USA)

PS 17: Cognitive Flexible Spectrum Management for Improving the Efficiency of LTE Network Segments in the Wireless B3G World

Aggelos Saatsakis, Kostas Tsagkaris (University of Piraeus, Greece)
Dirk von Hugo (T-Systems Nova GmbH, Germany)
Matthias Siebert (T-Mobile International AG, Germany)
Manfred Rosenberger (T-Systems, Germany)
Panagiotis Demestichas (University of Piraeus, Greece)

PS 18: Physical Interference Driven Dynamic Spectrum Management

Lei Yang, Lili Cao, Haitao Zheng (University of California - Santa Barbara, USA)

PS 19: Detecting Selfish Behavior in a Cooperative Commons

Hyun Jin Kim, Jon Peha (Carnegie Mellon University, USA)

PS 20: Primary Users in Cellular Networks: A Large-scale Measurement Study

Daniel Willkomm (Technische Universität Berlin, Germany)
Sridhar Machiraju, Jean Bolot (Sprint, USA)
Adam Wolisz (Technical University of Berlin, Germany)

PS 21: Detection of Spectral Resources in Cognitive Radios Using Reinforcement Learning

Ulrich Berthold (Universität Karlsruhe (TH), Germany)
Fangwen Fu, Mihaela van der Schaar (University of California - Los Angeles, USA)
Friedrich Jondral (Universität Karlsruhe (TH), Germany)

PS 22: Probability-based Transmit Power Control for Dynamic Spectrum Access

Xiangwei Zhou, Jun Ma, Geoffrey Li (Georgia Tech, USA)
Young Hoon Kwon, Anthony Soong (Huawei Technologies, USA)

PS 23: Stochastic Game Formulation for Cognitive Radio Networks learning in Stochastic Games for Cognitive Radio Networks

Fangwen Fu, Mihaela van der Schaar (University of California - Los Angeles, USA)

Thursday, 16 October 2008

Meeting Room: Crystal Ballroom Balcony

14:00 – 17:00 Poster Viewing

17:00 – 18:30 Poster Discussions

PS 24: Evaluation of Cooperative Spectrum Sensing based on Large Scale Measurements

Matthias Wellens, Janne Riihijärvi, Martin Gordziel, Petri Mähönen (RWTH Aachen University, Germany)

PS 25: SAMER: Spectrum Aware Mesh Routing in Cognitive Radio Networks

Ioannis Pefkianakis (University of California - Los Angeles, USA)
Ho Yin Starsky Wong (IBM T.J. Watson Research Center, USA)
Songwu Lu (University of California - Los Angeles, USA)

PS 26: Exploiting Hidden Power Feedbacks in Cognitive Radio Networks

Rui Zhang, Ying-Chang Liang (Institute for Infocomm Research, Singapore)

PS 27: Security-enhanced Virtual Channel Rendezvous Algorithm for Dynamic Spectrum Access Wireless Networks

Liangping Ma (Argon ST, Inc., USA)
Chien-Chung Shen (University of Delaware, USA)

PS 28: Exploiting Interference Diversity for Event-Based Spectrum Sensing

Arash Parsa, Amin Gohari, Anant Sahai (University of California - Berkeley, USA)

PS 29: On Optimal Control for Opportunistic Spectrum Access of Cognitive Radio Networks

Senhua Huang, Xin Liu, Zhi Ding (University of California - Davis, USA)

PS 30: Fast Discovery of Spectrum Opportunities in Cognitive Radio Networks

Hyoil Kim, Kang G. Shin (University of Michigan, USA)

PS 31: Signal Power Model for Dynamic Spectrum Allocation Close to the Cell Border of the Primary Transmitter

Konstantinos Koufos, Kalle Ruttik (TKK, Finland)
Riku Jantti (Helsinki University of Technology, Finland)

PS 32: Hammer Model Threat Assessment of Cognitive Radio Denial of Service Attacks

Amita Sethi, Timothy Brown (University of Colorado, USA)

PS 33: Spectrum Enforcement and Liability Assignment in Cognitive Radio Systems

George Atia (Boston University, USA)
Anant Sahai (University of California - Berkeley, USA)
Venkatesh Saligrama (Boston University, USA)

PS 34: Learning for Cognitive Wireless Users

Yi Su, Mihaela van der Schaar (University of California - Los Angeles, USA)

PS 35: Spectrum Load Balancing for Flexible Spectrum Usage in Local Area Deployment Scenario

Sanjay Kumar, Yuanye Wang, Nicola Marchetti (Aalborg University, Denmark)
Istvan Kovacs, Klaus Pedersen (Nokia Siemens Networks, Denmark)
Preben Mogensen (Nokia Siemens Networks, Aalborg, Denmark)

PS 36: Long-term, Wide-band Spectral Monitoring in Support of Dynamic Spectrum Access Networks at IIT's Spectrum Observatory System

Dennis Roberson, Roger Bacchus, Antoni Fertner, Cynthia Hood (Illinois Institute of Technology, USA)

PS 37: Spectrum Simulation Testbed for Dynamic Spectrum Access

Eugene Pappas, Sarah Boettcher, Chris Mascaro (ITT Corporation, USA)
Serey Thai (DISA, USA)

PS 38: Models for Analyzing Cognitive Radio Interference to Wireless Microphones in TV Bands

Ramandeep Dhillon, Timothy Brown (University of Colorado, USA)

PS 39: The Impact of Spectrum Sensing Time on the Performance of the GADIA Algorithm

Behtash Babadi, Vahid Tarokh (Harvard University, USA)

PS 40: Towards a Unified Policy Language for Future Communication Networks: A Process

Mieczyslaw Kokar (Northeastern University, USA)
Donald Hillman (Lehigh University, USA)
Shujun Li (Northeastern University, USA)
Bruce Fette (General Dynamics C4 Systems, USA)
Preston Marshall (DARPA, USA)
Mark Cummings (en Via, USA)
Todd Martin (Science Technology Associates, USA)
John Strassner, (Motorola, Inc, USA)

PS 41: Towards Optimal Opportunistic Spectrum Utilization in Cognitive Radio Networks

Dan Xu, Eric Jung, Xin Liu (University of California - Davis, USA)

PS 42: Using a Shielded Room to Characterize UDP Performance in the Presence of Interference in IEEE 802.11 Wireless Networks

Udayan Das, Cynthia Hood (Illinois Institute of Technology, USA)

PS 43: Spectrum Commodity Exchange implemented through Real Time Disaggregation of Spectrum

Peter Stanforth (Spectrum Bridge, USA)
PS 44: Tamper Resistance for Software Defined Radio Software
Shucaai Xiao, Jung-Min Park, Yanzhu Ye (Virginia Tech, USA)

PS 45: Underlay Multiple Access in Cognitive Cooperative Ad Hoc Network Based on Interference Temperature

Shadi Ebrahimi Asl, Bahman Abolhassani (Iran University of Science and Technology, Iran)

PS 46: Spectrum Enforcement and Liability Assignment in Cognitive Radio Systems

George Atia (Boston University, USA)
Anant Sahai (University of California - Berkeley, USA)
Venkatesh Saligrama (Boston University, USA)

GENERAL INFORMATION

IEEE DySPAN 2008 Badges

IEEE DySPAN 2008 Badges must be worn at all times and are necessary for entrance into all IEEE DySPAN events.

Registration

All attendees must register and receive a conference badge in order to participate in conference activities.

Hours for the Registration Desk

Tuesday, 14 October	7:30 – 18:00
Wednesday, 15 October	7:30 – 18:00
Thursday, 16 October	7:30 – 17:00
Friday, 17 October	7:30 – 12:00

Conference Meals

Included in the price of full registration are the Welcome Reception, Networking Breaks and the Evening Banquet.

A Friendly Reminder

Please turn off anything that chirps, beeps, buzzes or rings which includes but not limited to pagers, beepers, cell phones, PDA and laptops during the conference. The speakers and audience thank you for your consideration and cooperation.

WiFi Access

There is wireless Internet access in the lobby of the conference hotel, the Millennium Knickerbocker.

Dress Attire

Business casual is recommended for all daytime and evening IEEE DySPAN 2008 events.

Conference Hotel

Millennium Knickerbocker Hotel Chicago
163 East Walton Place @ North Michigan Avenue
Chicago, Illinois, USA 60611
Telephone: +1 (312) 751-8100
Fax: +1 (312) 751-9205

Electricity

The US uses 110-120 volts, 60 cycles, compared to 220-240 volts, 50 cycles in many parts of the world. To use standard American appliances, you'll need both a transformer and a plug adapter. Most new laptops have built-in transformers, but some do not, so beware. Attempting to use only a plug adapter is a sure way to fry your appliance or, worse, cause a fire.

Emergencies

For fire and all other emergencies, including medical, dial tel. 911.

Getting Around

Taxis are abundant and you pay the amount shown on the meter, plus any tolls. There is no extra charge for baggage or credit card use. Drivers expect a tip of 10%-20% of the total fare. Chicago is a great walking city. To orient yourself, remember that Madison divides the city into north-south and State St. divides it east-west. There are approximately eight blocks to one mile. There is an extensive bus and subway system. For more information, see <http://www.transitchicago.com>. Chicago is also very accommodating to cyclists. Bikes can be rented at Navy Pier. Visit the Chicago Department of Transportation (CDOT) web site for more information.

Taxes

Chicago has a complex system of sales taxes, ranging from 10.25% on non-perishable goods purchased, with a 2% levy on grocery items, drugs, and medical appliances, an additional 1% tax on food and beverage purchases in the downtown area; car rentals are taxed at 20%; hotel rooms, 15.4%; soft drinks, 13.25%.

Time

Chicago is on Central Standard Time, which is 6 hours earlier than GMT; 1 hour earlier than the East Coast; 2 hours later than the West Coast.

Tipping

Restaurant wait staff, taxi drivers, and bartenders are usually tipped between 15%-20% of the pre-tax bill. Many restaurants add the tip into the bill for parties of six or more. Doormen, concierges and valet staff will expect \$1-\$2 for their services.

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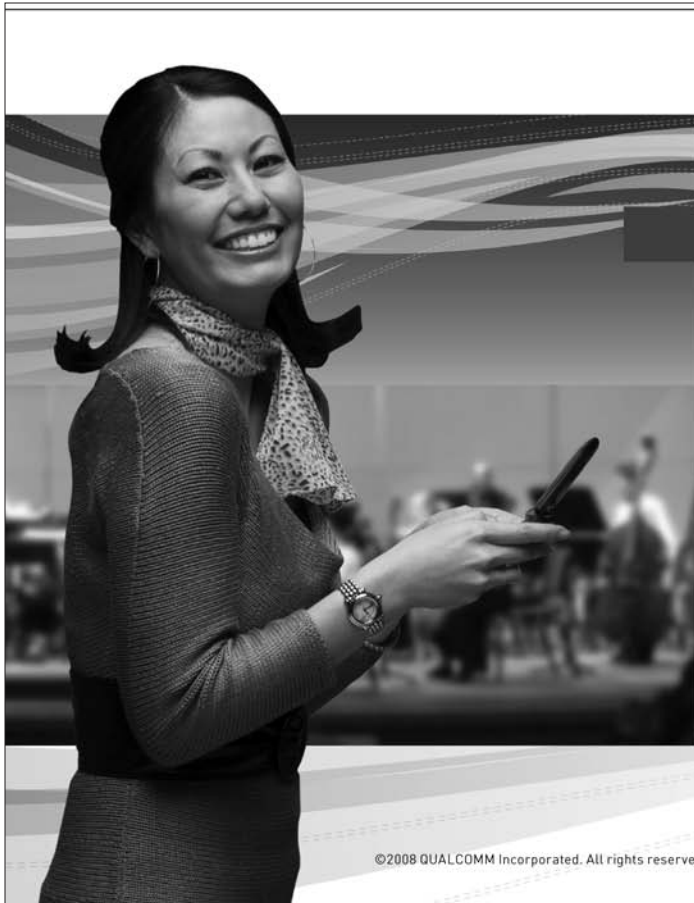
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Foster original work in all aspects of communications science, engineering, and technology.

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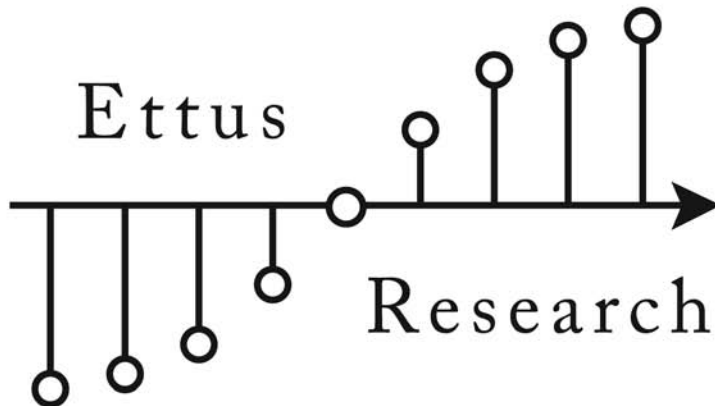
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To further those objectives, Researchers are exploring cognitive and spectrum-aware networking. To achieve optimal performance in a crowded spectrum bulging with wireless devices, it is important to make wireless networks operate in the cleanest frequency spectrum and using as much of the spectrum as is available. The design of such networks is an active area of research within Microsoft, as demonstrated by its sponsorship of the Cognitive Wireless Networking Summit, held in June 2008 in Snoqualmie, Wash. Related research investigates software defined radios, mobile systems and services, data-center networking and cloud services, and security and privacy.

For more information, please visit <http://research.microsoft.com/netres/>

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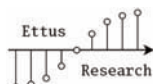


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