CONNECT • COMMUNICATE • COLLABORATE
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AT THE 2012 IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS

IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS 2012

JUNE 10-15, **2012**
OTTAWA, **CANADA**

IEEE

IEEE COMMUNICATIONS SOCIETY

ADVANCE PROGRAM

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IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS 2012

JUNE 10-15, 2012
OTTAWA, CANADA

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PROGRAM AT A GLANCE

Conference Program

IEEE International Conference on Communications 2012
"CONNECT • COMMUNICATE • COLLABORATE"

Ottawa, Ontario, Canada, June 10-15, 2012

Time/Day	Sunday June 10	Monday, June 11		Tuesday, June 12		Time/Day	Wednesday, June 13		Thursday, June 14		Friday, June 15	
07:00 - 08:00				Presenters' Breakfast		07:00 - 08:00	Presenters' Breakfast		Presenter' Breakfast			
08:15 - 09:30	Exhibition Hall - Setup (Sunday, June 10, 1:30 pm - 8:00 pm) + Exhibition Hall -Setup (Monday, June 11, 8:00 am - 5:00 pm)	Tutorials	Workshops	Welcome & Opening Ceremony Keynote: Eros Spadotto, TELUS		08:00 - 09:45	Technical Symposia (20 O S+ 4 PS)	Industry Forums SA02 & MM03	Technical Symposia (20 O S+ 4 PS)	Industry Forums SA04 & MM05	Tutorials	Workshops
09:30 - 10:30				Keynote: Ian Akyildiz, Georgia Tech		09:45 - 10:10	Break					
10:30-10:45				Break		10:10- 10:45	Keynote: Matt Bross, Huawei		Keynote: Marcus Weldon, ALU			
10:45-12:30				Technical Symposia (20 OS + 5 PS)	Industry Forums SA01 & Infra01	10:45- 11:20	Technical Plenary Vincent Poor, Princeton University		Technical Plenary Raj Jain, Washington University, St-Louis			
						11:20- 11:55	Industry Plenary Lucy Hood, CTM		Industry Plenary Mike Hill, IBM			
						11:55- 12:30	Technical Plenary P. R. Kumar, Texas A&M University		Technical Plenary Victor Bahl, Microsoft			
12:30 - 14:00	Registration Open (1:00 pm - 5.00 pm)	Lunch break		ComSoc Awards Luncheon		12:30 - 14:00	Lunch break				Lunch break	
14:00 - 15:45		Tutorials	Workshops	Technical Symposia (20 O S+ 4 PS)	Industry Forums Infra02 & MM01	14:00 - 15:45	Technical Symposia (20 O S+ 4 PS)	Industry Forums SA03 & Infra04	Technical Symposia (20 O S+ 4 PS)	Industry Forums SA05 & MM06	Tutorials	Workshops
15:45 - 16:15				Break		15:45 - 16:15	Break					
16:15 -18:00				Technical Symposia (20 O S+ 4 PS)	Industry Forums Infra03 & MM02	16:15 -18:00	Technical Symposia (20 O S+ 4 PS)	Industry Forums Infra05 & MM04	Technical Symposia (20 O S+ 4 PS)	Industry Forums SA06 & Infra06		
18:00 - 19:00						18:00 - 19:00	VIP Reception: ComSoc BOG & Patrons					
19:00 - 21:30	Welcome Pre-reception Activity	Welcome Reception (OCC) & Official Opening of Exhibition		Patron Hosted Events		19:00 - 21:30	Conference Banquet Keynote: Terry Mathews					

KEYNOTE SPEAKERS

Tuesday, June 12, 2012
8:00 – 9:40
Eros Spadotto
Executive Vice President
Technology Strategy
TELUS

Wednesday, June 13, 2012
10:10 – 10:45
Matt Bross
CTO & Vice Chairman
Huawei

Thursday, June 14, 2012
10:10 – 10:45
Marcus Weldon
CTO
Alcatel-Lucent

INDUSTRY PLENARY SPEAKERS

Wednesday, June 13, 2012
11:20 – 11:55
Lucy Hood
Executive Director
Communication Technology Management

Thursday, June 14, 2012
11:20 – 11:55
Mike Hill
Vice President, Enterprise Initiatives
IBM

TECHNICAL PLENARY SPEAKERS

Tuesday, June 12, 2012
9:40 – 10:15
Ian Akyildiz
Professor
Georgia Tech

Wednesday, June 13, 2012
10:45 – 11:20
H. Vincent Poor
Professor
Princeton University

Wednesday, June 13, 2012
11:55 – 12:30
P. R. Kumar
Professor
Texas A&M University

Thursday, June 14, 2012
10:45 – 11:20
Raj Jain
Professor
Washington University,
St-Louis

Thursday, June 14, 2012
11:55 – 12:30
Victor Bahl
Director, MCRC
Microsoft

For further updates, visit www.ieee-icc.org.2012.

The Industry Forums are designed to deliver broad interest in telecommunication industry's current practiced technology, major technology implementations, complex IT business systems, regulatory impact assessments, economic models, and engineering methods used by industry practitioners.

The Industry Forums are focused on three pillars with a total of 18 unique forum sessions planned.

Technology Pillars	Forum names	Tuesday, June 12	Wednesday, June 13	Thursday, June 14
Services and Applications	Social Networks	10:45 – 12:30		
	National Systems		08:00 – 09:45	
	Advanced Technologies		14:00 – 15:45	
	Patent and Licensing Strategies			08:00 – 09:45
	Government and Defence			14:00 – 15:45
	Identity Management			16:15 – 18:00
Infrastructure	Cloud Infrastructure and Networking	10:45 – 12:30		
	Heterogeneous Networks	14:00 – 15:45		
	Network Technologies	16:15 – 18:00		
	Cloud Security		14:00 – 15:45	
	Mobile Backhaul		16:15 – 18:00	
	Content & CDN			16:15 – 18:00
Middleware and Management	Cloud Management	14:00 – 15:45		
	Edge Networking	16:15 – 18:00		
	Security		08:00 – 09:45	
	Green Communications		16:15 – 18:00	
	IPTV			08:00 – 09:45
	IPv6			14:00 – 15:45

Tuesday, June 12, 2012 • 10:45 – 12:30

Services and Applications: Social Networks

Chair: Neeli Prasad, Head of Research, Center for TeleInFrastruktur, Aalborg University

Social Networks: Impact on Quality of Life
Neeli Prasad, Head of Research, Center for TeleInFrastruktur, Aalborg University

Everything Connected: Benefits and Challenges to Your Quality of Life
Monique Jeanne Morrow, Distinguished Consulting Engineer Office of the CTO, Cisco Systems Inc.

Multimedia is turning social: how Social Networks can affect our multimedia access
Ing Charalampos Z. Patrikakis, Professor TEI of Piraeus, Senior Research Associate of Institute of Communications and Computer Systems

Security and Business Model
Yuan Xiang Gu, Cloakware Co-Founder & Chief Architect; Senior Director, Irdeto Research, Ottawa

Social Networks
Warren Cope, Senior Manager, Core Technology Strategy and Architecture, Sprint, USA

Tuesday, June 12, 2012 • 10:45 – 12:30

Infrastructure: Cloud Infrastructure and Networking

Chair: TBA

Simplifying the Path to a Profitable Next-Generation Network
Robert Keys, Chief Architect, Optical, BTI Systems

The Value of the True Green Data Center
Wael Diab, Senior Technical Director, Office of the CTO, Broadcom Corporation

Split Radio Stacks and Cloud Wireless
Jordan Melzer, Senior Engineer, TELUS

The Interconnect Standard for the Data Center: 10GBase-T
Frank McCarthy, Principal Engineer, PLX Technology, Inc.

Tuesday, June 12, 2012 • 14:00 – 15:45

Infrastructure: Heterogeneous Networks

Panel on Heterogeneous Network (HetNet) Deployment: Challenges and Strategies
Chair: Jie Zhang, University of Sheffield

Panelists:
Jie Zhang, University of Sheffield
Satoshi Konishi, KDDI
Yoshihisa Kishiyama, DoCoMo
David López-Pérez, King's College London
Charlie (Jianzhong) Zhang, Samsung
Jonathan Foster, Ranplan

Tuesday, June 12, 2012 • 14:00 – 15:45

Middleware and Management: Cloud Management

Chair: Craig Farrell, IBM

The Cloud Changes Everything: Enhanced Revenue Opportunities for Service Providers
Ken Cheng, VP & GM, IP Products Division, Brocade

Enable your Cloud: How to Plan, Design and Manage Cloud Networks and Applications for the Future
Mannix O'Connor, Director of Technical Marketing, Optical Communications Systems Division, MRV Communications

For further updates, visit www.ieee-icc.org/ifp.html.

Service Personalization in Telecom Networks - A Large Scale Cloud based Distributed Recommender Approach
Jobin Wilson, R&D, Flytxt Mobile Solutions Pvt. Ltd, India
Cloud Billing: The Missing Link for Cloud Providers
Rene Sotola, Vice President, CGI Global Telecommunications Sector

Tuesday, June 12, 2012 • 16:15 – 18:00

Infrastructure: Network Technologies

Chair: Rodney G. Wilson, Senior Director External Research, Ciena

Advanced DSL Technologies-potentials and Challenges
Guozhu Long, Principal Scientist, Advanced Access Technologies, Huawei Technologies
Amir Fazlollahi, Principal Engineer, Huawei Technologies

Wired Broadband and Maximizing Optical Fiber Plant Advancements
Rodney G. Wilson, Senior Director External Research, Ciena

End-to-end Ethernet Service Management
Vikas Arora, CTO, EXFO

Core Network Technologies for On-demand Services
Tim Pearson, Ciena

Creating Innovative Network Services in IMS/LTE Field
Naoki Uchida, Director, Service Innovation Project, NTT Cyber Space Labs

Tuesday, June 12, 2012 • 16:15 – 18:00

Middleware and Management: Edge Networking

Chair: Chris Bachalo, CTO, Juniper Networks Canada Inc.

Future of In-home Networking
Matt Christensen, Technology Strategy, TELUS

Future Home Gateway Services for Next Generation Home Networks
Lorenzo Di Gregorio, Lantiq Deutschland GmbH

Developing Innovative Embedded Applications on Programmable Networks
Chris Bachalo, CTO, Juniper Networks Canada Inc.

Basic Resources Service for the Internet of Things
Ye Tian, CNNIC (China iNternet Network Information Center)

Wednesday, June 13, 2012 • 08:00 – 09:45

Services and Applications: National Systems

Chair: TBA

Quality Improvement of Telecommunications Industry in Pakistan
Ashfaq Naqvi, Executive Engineer, WorldCall Telecom Ltd.

Bandwidth management dynamics in India's eGovernance
V. M. Mathur, Professor in Management and IT, Information Systems and Technology Panel
Lifetime and Throughput Maximization - Self Optimization Techniques in Wireless Networks
Hemant Kumar Rath, TCS Networks Lab, Bangalore

Wednesday, June 13, 2012 • 08:00 – 09:45

Middleware and Management: Security

Chair: Stan McClellan, Texas State University

Standards & Interoperability in the Smart Grid
George Arnold, Director, Smart Grid and Cyberphysical Systems Program Office & National Coordinator for Smart Grid Interoperability, NIST (US Dept. Commerce)

Situational Awareness, Stability and Cyber-security in the Smart Grid
William Lawrence, Chief Technologist, Energy & Cyber Security Organization, Lockheed Martin

Four Layers of Smart Grid Security
Ernest Hayden, Managing Principal, Energy Security, Verizon Business

Penetration Testing for Embedded Systems in the Smart Grid
Nakul Jeirath, Group Leader, Embedded Systems Security, Southwest Research Institute

Wednesday, June 13, 2012 • 14:00 – 15:45

Services and Applications: Advanced Technologies

Chair: TBA

M2M Communications and Evolution to IoT (Internet-of-Things)
Paul Russell, Jr., InterDigital Communications

Facing the Bandwidth Demand Onslaught: How the industry will have to address this and where the research community can help?
Alex Reznik, Sr. Principal Engineer, Systems InterDigital Communications, LLC

Wireless Sensor Network for Urban Environment Monitoring
Mario LaManna, SELEX Sistemi Integrati, Rome

SOC Architecture Evolution as a Key Driver of Wireless Network Transformation
Fawzi Behmann, Director of Marketing & Strategic Advisor, Power.org, Chair COMSOC/SP Austin Chapter

Cognitive Radio over fibre for Next-Generation Mesh Networks
Anwer Al-Dulaimi, Brunel University

Wednesday, June 13, 2012 • 14:00 – 15:45

Infrastructure: Cloud Security

Panel on Security of Cloud Communications and Networking
Chair: Mohamed Hamdi,
School of Communication Engineering of Tunisia

Panelists:
Mohamed Hamdi, School of Communication Engineering of Tunisia
Peter Mueller, IBM Zurich
Habtamu Abie, Norwegian Computing Center

Wednesday, June 13, 2012 • 16:15 – 18:00

Infrastructure: Mobile Backhaul

Chair: TBA

Packet-based Mobile Backhaul Network with Synchronization – Myths versus reality
Zeev Draer, VP, Marketing, Optical Communications Systems Division, MRV Communications

For further updates, visit www.ieee-icc.org/ifp.html.

The All-packet Network for Mobile Backhaul
Peter Green, General Product Manager, Ethernet Solutions, BTI Systems

Challenges with Enabling Dynamic LTE Infrastructure with 4G Roll-outs
Stephen F. Fiore, Principal Consultant & Sr. Principal RF Engineer, PrioriTech, Inc

The Proliferation of Ethernet in the Mobile Backhaul
Eric Hayes, Senior Director, Product Marketing, Network Switch, Broadcom Corporation

LTE Network Coverage
Tomas Novosad, Nokia Siemens Networks

Wednesday, June 13, 2012 • 16:15 – 18:00

Middleware and Management: Green Communications and Computing

Chair: Jinsong Wu, Alcatel-Lucent, Bell Labs

Energy Trade-Offs for Next Generation Services
Daniel Kilper, Bell Laboratories

Green Last Mile: The Case for Fibre-Connected Massively Distributed Antennas
Victor Leung, University of British Columbia

Recent Progresses in Green Radio Communications
Shugong Xu, Huawei Technologies

Cognitive Green Communications: When Energy Meets Intelligence
Honggang Zhang, Zhejiang University

A High Level View of Green Communications and Computing
Jinsong Wu, Bell Laboratories

Thursday, June 14, 2012 • 08:00 – 09:45

Services and Applications: Patent and Licensing Strategies

Chair: Curtis B. Behmann, Borden Ladner Gervais LLP

Panel on Enhancing Technology Development & Market Success Using Patent & Licensing Strategies

Panelists:
Steve Gorshe, PMC-Sierra
Steve Chang, Banner & Witcoff Ltd
Robert Guay, Research In Motion
Michael Vladescu, Chief Operating Officer, WiLAN

Thursday, June 14, 2012 • 08:00 – 09:45

Middleware and Management: IPTV

Chair: TBA

OTT Adaptive Streaming Media and the IPTV QA Monitoring Mission
Jim Welch, Sr. Consulting Engineer, IneoQuest Technologies

Multi-screen IPTV: Enabling Technologies and Challenges
Peng Tan, Sr.Engineer, Technology Strategy, TELUSb

JPEG 2000 Image Transmission using Encryption Domain Authentication by Paillier Cryptosystem
Muneaki Matsuo, Kyushu Institute of Technology

Thursday, June 14, 2012 • 14:00 – 15:45

Services and Applications: Government and Defence

Chair: Malcolm Vant, Special Officer, DRDC Ottawa

A Knowledge Services Architecture: Structured Support for Unstructured Work
Albert J. Simard, Knowledge Manager, Defence Research & Development Canada

NATO Cyber Defence Policy and Cyber Security Roundtable Summary
Guy Vezina, Director General, Defence R&D Canada – Valcartier & Chair of NATO Research & Technology Organization, Information Systems and Technology Panel

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Thursday, June 14, 2012 • 14:00 – 15:45

Middleware and Management: IPv6

Chair: Latif Ladid, President IPv6 Forum, Senior Researcher, SnT – University of Luxembourg

IPv6 – The Impact on Cloud Computing: From Closed Cloud to Open Inter-cloud
Latif Ladid, President IPv6 Forum, Senior Researcher, SnT – University of Luxembourg

The Impact of IPv6 on the Large ISPs
Yves Poppe, Director, Business Development IP Strategy, Tata Communications

The Impact of IPv6 on the Enterprise – Explained by One the Original IPv6 IETFers
Marc Blanchet, President & CEO, Viagénie

IPv6 Deployment Recommendations for ICT Standards Advisory Council of Canada (ISACC)
Serge Caron, Senior Director, Information Services and Technology, ITD, CIOB, Treasury Board Secretariat at Government of Canada

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Thursday, June 14, 2012 • 16:15 – 18:00

Services and Applications: Identity Management

Chair: Amit Jasuja, Oracle

Thursday, June 14, 2012 • 16:15 – 18:00

Infrastructure: Content & CDN

Chair: TBA

For further updates, visit www.ieee-icc.org/ifp.html.

The Technical Symposia will feature over 1,000 peer reviewed papers on current research and development in the following 12 areas organized into 209 oral and poster sessions.

AH:	Ad Hoc and Sensor Networks
CIS:	Communication and Information System Security
CRN:	Cognitive Wireless Networks
CQR:	Communication QoS, Reliability and Modeling
CT:	Communication Theory
CSS:	Communications Software and Services
NGN:	Next-Generation Networking
ONS:	Optical Networks and Systems
SPC:	Signal Processing for Communications
WC:	Wireless Communications
WN:	Wireless Networks
SA-AN:	Selected Area – Access Networks
SA-SSC:	Selected Area – Satellite and Space Communications
SA-SG:	Selected Area – Smart Grid
SA-TCO:	Selected Area – Tactical Communications and Operation
SA-EH:	Selected Area – E-Health
SA-PLC:	Selected Area – Powerline Communications

Tuesday, June 12, 2012

Tuesday, June 12, 2012 • 10:45 – 12:30

AH01: Localization I
AH02: Delay Tolerant Networks (DTN)
AH03: Cognitive Wireless Networks
CISS01: Algorithmic Design
CISS02: Attack and Defense
CQR01: Network Measurement and Monitoring Techniques
CRN01: Spectrum Sensing I
CSS01: Quality of Services
CT01: MIMO I
CT02: LDPC Codes
NGN01: P2P and Content Based Networks I
SA-AN1: Access Networks I
SPC01: Channel Estimation, Equalization and Decoding I
SPC02: Cognitive Radio Systems
WC01: Multiuser MIMO
WC02: Cooperative Communications: Resource Allocation
WC03: Hybrid ARQ
WC04: OFDM
WN01: LTE/WiMAX Networks
WN02: Wireless Sensor Network Design

Poster Sessions
AH-P1: Mobile Ad Hoc and Sensor Networks
CQR-P1: Network Measurement and Monitoring Techniques
CRN-P1: Spectrum Sensing
ONS-P1: Optical Networking
SA-SSC-P1: Satellite & Space Communications Systems I

Tuesday, June 12, 2012 • 14:00 – 15:45

AH04: Routing I
AH05: Security I
AH06: Clustering
CISS03: Authentication
CISS04: Channel Analysis
CQR02: Quality, Scalability and Performance in the Internet I
CRN02: Cooperative Spectrum Sensing
CSS02: Communication Optimization
CT03: Relay I
CT04: Channel Capacity
NGN02: P2P and Content Based Networks II
SA-AN2: Access Networks II
SPC03: Cooperative Communications
SPC04: Secured Communications
WC05: Space-Time Coding I
WC06: Performance Analysis for Relay Systems I
WC07: Energy Efficient Design I
WC08: Dynamic/Opportunistic Spectrum Access
WN03: 802.11 Wireless Networks
WN04: Multicast & Broadcast in Wireless Networks

Poster Sessions
AH-P2: Transmission and Multi-hop Forwarding
CQR-P2: Quality, Scalability and Performance in the Internet
CRN-P2: Performance Modeling and Analysis
SA-SSC-P2: Satellite & Space Communications Systems II

Tuesday, June 12, 2012 • 16:15 – 18:00

AH07: Routing II
AH08: Energy-Efficient Networking Algorithms and Protocols
AH09: Mobile and Vehicular Ad Hoc Networks
CISS05: Infrastructure Security
CQR03: TCP/IP Performance
CQR04: Quality and Performance for Network and Services
CRN03: Spectrum Sensing II
CSS03: Energy Efficiency
CT05: Interference Alignment
CT06: Detection, Decoding and Equalization
NGN03: Traffic Engineering and Congestion Control
SA-SSC1: Satellite & Space Communications
SPC05: OFDM and Multi-Carrier Systems I
SPC06: Optimization
WC09: Cooperative Communications: Coding and Diversity
WC10: Cross-Layer Design
WC11: Relay Selection
WC12: Interference Management
WN05: Medium Access Control
WN06: Cooperative Networking & Network Coding

Poster Sessions
AH-P3: Wireless Network Applications II
CRN-P3: Learning, Spectrum Analysis, and Spectrum Access
SA-EH-P1: SAC E-Health
WC-P1: Topics in Wireless Communications I

For a complete list of papers, visit www.ieee-icc.org/symposiaprogram.html.

Wednesday, June 13, 2012

Wednesday, June 13, 2012 • 8:00 – 09:45
AH10: Routing III
AH11: Scheduling
AH12: Cooperative Networking
CISS-06: Wireless Sensor Network Security
CQR05: Quality and Performance in Grid, Distributed and Cloud Computing
CQR06: Quality, Scalability and Performance in the Internet II
CRN04: Resource Allocation I
CSS04: Peer-to-Peer
CT07: Multicell Network
CT08: Wireless Networks
NGN04: Network Virtualization
ONS01: Energy-efficient Optical Networks I
SA-SSC2: Satellite & Space Networking
SPC07: Beamforming and Multi-antenna Systems I
WC13: Coordinated Multi-Point Transmission Systems
WC14: Space-Time Coding II
WC15: MIMO I
WC16: Relay Technologies I
WN07: Femtocell Networks I
WN08: Wireless Relay Networks I

Wednesday, June 13, 2012 • 14:00 – 15:45
AH13: Medium Access Control (MAC) I
AH14: Resource Allocation
AH15: Performance Evaluation
CISS07: Malware and OS Security
CQR07: Quality and Performance in Next Generation Mobile Networks
CRN05: Resource Allocation II
CRN06: Performance Modeling and Analysis I
CSS05: Streaming
CT09: Network Information Theory
CT10: Diversity
NGN05: Mobile and Wireless Networks I
ONS02: Energy-efficient Optical Networks II
SA-SG1: Smart Grid I
SPC08: Localization
WC17: Energy Efficient Design II
WC18: Resource Allocation
WC19: Spectrum Sensing for Cognitive Radio
WC20: Relay Technologies: Decode-and-Forward
WN09: Femtocell Networks II
WN10: Wireless Relay Networks II

Poster Sessions
AH-P4: Wireless Network Applications III (Poster Session)
NGN-P1: Topics on Next Generation Networking and Internet I
WC-P2: Topics in Wireless Communications II
WN-P1: Wireless Networks I

Wednesday, June 13, 2012 • 16:15 – 18:00
AH16: Wireless Sensor and Actor Networks I
AH17: Medium Access Control (MAC) II
AH18: Security II
CISS08: Mobile Security
CQR08: Quality and Performance in Wireless Networks
CRN07: Spectrum Analysis
CRN08: Spectrum Access I
CSS06: Coding
CT11: Performance Analysis
CT12: Relay II
NGN06: Mobile and Wireless Networks II
ONS03: Optical Network Survivability
SA-SG2: Smart Grid II
SPC09: Channel Estimation, Equalization and Decoding II
WC21: UWB
WC22: Relay Technologies II
WC23: Wireless Channel and Propagations
WC24: Network Coding
WN11: Scheduling in Wireless Networks
WN12: Energy Efficiency

Poster Sessions
NGN-P2: Topics on Next Generation Networking and Internet II
SPC-P1: Signal Processing for Communications I
WC-P3: Topics in Wireless Communications III
WN-P2: Wireless Networks II

For a complete list of papers, visit www.ieee-icc.org/symposiaprogram.html.

Thursday, June 14, 2012

Thursday, June 14, 2012 • 08:00 – 09:45
AH19: Localization II
AH20: Femtocell and Networks
AH21: Wireless Sensor and Actor Networks II
CISS09: CISS09: Multimedia Security
CQR09: Information based Wireless and Mobile Networks and Services
CRN09: Performance Modeling and Analysis II
CRN10: Spectrum Access II
CSS07: Resource Management
CT13: Heterogeneous Network
CT14: Network Coding
NGN07: Routing I
ONS04: Optical Network Design and Control
SA-TCO1: Tactical Communications and Operations
SPC10: MIMO Systems
WC25: Performance Analysis for Relay Systems II
WC26: Cognitive Radio Networks
WC27: OFDMA
WN13: Resource Allocation I
WN14: Vehicular and Mobile Ad Hoc Networks
WN15: Heterogeneous Wireless Networks

Thursday, June 14, 2012 • 14:00 – 15:45
AH22: Wireless Mesh Networks
AH23: Relay and Network Coding
AH24: Mobile and Vehicular Networks
CISS10: Network Analysis
CQR10: Network Modeling & Performance Evaluation Techniques
CRN11: Game Theory and Network Economics
CRN12: Performance Modeling and Analysis III
CSS08: Collaborative Media
CT15: MIMO II
NGN08: Routing II
NGN09: Content Delivery and Cloud Computing
ONS05: Optical Access Networks I: PON
SA-EH1: SAC E-Health
SPC11: Beamforming and Multi-antenna Systems II
WC28: Coding
WC29: Physical-Layer Network Coding
WC30: Wireless Systems
WN16: Resource Allocation II
WN17: Opportunistic Wireless Networking
WN18: Mobile Wireless Networks

Poster Sessions
CISS-P1: P2P Security
CT-P1: Compressed Sensing and New Applications
SPC-P2: Signal Processing for Communications II
WC-P4: Topics in Wireless Communications IV

Thursday, June 14, 2012 • 16:15 – 18:00
AH25: Wireless Sensor and Actor Networks III
AH26: Algorithms and Protocols for Wireless Networks
AH27: Wireless Network Applications I
CISS-P2: Intrusion Detection
CISS11: Privacy and Information Hiding
CQR11: Performance Modeling of Next Generation Networks
CRN13: Interference Analysis and Management
CT-P2: Wireless Communications
CT16: Coding Theory
NGN10: Cloud and Data Center
NGN11: Router Architecture & Switch Design
ONS06: Optical Access Networks II: OCDMA and FSO
SA-PLC1: SAC-Powerline Communications
SA-EH2: SAC E-Health
SPC12: Channel Modeling
SPC13: OFDM and Multi-Carrier Systems II
WC-P5: Topics in Wireless Communications V
WC31: MIMO in Cooperative Communications
WC32: MIMO II
WC33: Estimation and Detection
WN19: Performance Evaluation for Wireless Networks
WN20: Modeling and Optimization
WN21: Routing in Wireless Networks

Poster Sessions
CISS-P2: Intrusion Detection
CSS-P1: CSS-P1
CT-P2: Wireless Communications
WC-P5: Topics in Wireless Communications V

For a complete list of papers, visit www.ieee-icc.org/symposiaprogram.html.

Monday, June 11, 2012 • 08:30 – 12:30

Signal Waveform Design for Underwater Acoustic Communications

Instructors: Charalampos C. Tsimenidis, Newcastle University, UK
Bayan S. Sharif, Newcastle University, UK

This tutorial will cover the design of signalling waveforms that are suitable for utilization in underwater acoustic (UA) modems. These will include PN sequences with low auto and cross-correlation properties, chirp design, in conjunction with pulse shaping and layered 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.

Monday, June 11, 2012 • 08:30 – 12:30

Application Architectures for Machine to Machine Communications: State of the Art and Research Directions

Instructor: Roch H. Glitho, Concordia University, Canada

Machine to Machine communications (M2M for short), a key component of Internet of Things (IoT), aims at enabling interactions between devices (e.g. sensors/actuators, smart meters) with little or no human intervention. This tutorial in four parts proposes an overview of M2M with a focus on application architectures. In the first part, the standard system architectures proposed so far for M2M (e.g. ETSI M2M architecture, Wimax M2M architecture) are introduced along with the standard communications and networking technologies (IEEE 802.15.4, Zigbee, 6LoWPAN) on which they rely. The second part discusses concrete M2M application use cases, and gives insights in the application architecture related - challenges. The use cases are used to derive a comprehensive set of requirements for M2M application architectures. In the third part, the body of knowledge in application architectures is reviewed in light of the requirements. The review includes the middleware proposed so far (e.g. RESTful Web services based - middleware). It also includes the novel applications layer protocols being developed (e.g, IETF CoAP) for M2M. The strengths and weaknesses are assessed. In the fourth part we discuss novel research directions such as the use of cloud computing and 4G Evolved Packet Core (EPC) as M2M applications enablers.

Monday, June 11, 2012 • 08:30 – 12:30

Recent Advances in Wireless Sensor Networks

Instructor: Dharma P. Agrawal, University of Cincinnati, USA

A large number of wireless sensor nodes (SNs) are used in a Wireless Sensor Network (WSN) and information from all SNs are collected at a Base Station (BS) or a sink. After introducing a SN, various characteristics of a WSN are covered in monitoring an unattended area. There is a need to learn about how regular WSN topologies can be effectively used for physically accessible areas. Results are presented on numerous advantages of using a regression polynomial. Impact of using powerful SNs on the system coverage and connectivity are also examined. Another scheme of minimizing packet traffic by collecting data using a mobile Base Station is also considered. Energy consumption throughout the area can be equalized by controlling data packet generation rate based on how far away the SNs are with respect to the BS. An innovative technique of distributing keys for shared secret key based communication in a WSN is described and various characteristics including resiliency are outlined. Monitoring of a battle-field using a WSN is also illustrated using boundary detection of a wild forest fire. Analytical model is introduced and are compared with simulation results. The need for layered sensing in secured communication is also investigated.

For further updates, visit www.ieee-icc.org/tutprogram.html.

Monday, June 11, 2012 • 14:00 – 18:00

60 GHz Wireless Communication

Instructors: Theodore S. Rappaport, New York University, USA
Robert W. Heath Jr., University of Texas, Austin, USA
Robert C. Daniels, Kuma Signals, LLC, USA

The millimeter-wave band, especially spectrum in the LMDS (28-38 GHz) and unlicensed 60 GHz bands, is at the spectral frontier of high bandwidth commercial wireless communication systems. Spectrum at 60 GHz is plentiful (up to 7 GHz unlicensed spectrum is available in many countries). Several emerging wireless standards will exploit 60 GHz to provide high data rate media streaming and rapid data transfer. Designing 60 GHz wireless systems offers different challenges than millimeter wave communication systems due to differences in the channel, circuits, antennas, algorithms, and protocols. This tutorial will provide a comprehensive introduction to 60 GHz wireless communication systems. It will discuss the entire system including propagation, RF/Analog circuits, the physical layer, and the link layer. It will discuss 60 GHz in several commercial standards including IEEE 802.15.3c and IEEE 802.11ad.

Monday, June 11, 2012 • 14:00 – 18:00

Content Streaming for Mobile Environments

Instructors: Mahbub Hassan, University of New South Wales, Australia
Salil Kanhere, University of New South Wales, Australia

With the proliferation of smart mobile devices, a growing number of users are now accessing streaming applications while travelling in cars, buses and trains. Market forecasts suggest that by year 2015, more than 50% of the total mobile traffic will come from streaming applications. Unfortunately, under high-speed mobility and growing network heterogeneity, mobile devices are facing increased uncertainty as well as more frequent and more substantial fluctuations in available network resources. Not only it has become more difficult to predict network bandwidth, but simply adapting multimedia quality to the predicted bandwidth is also no longer adequate as frequent and drastic quality variations reduce user quality of experience. Optimization of streaming quality in mobile environments therefore has become a challenging problem, which is receiving renewed attention from both academic and industrial research. This tutorial will provide a comprehensive overview of the latest research in the broad area of mobile streaming. Topics that will be covered include, but not limited to, characterization of bandwidth variability under high-speed mobility, use of location-based bandwidth prediction in multimedia content adaptation, introduction to HTTP-based streaming, and overview of emerging standards for mobile streaming. The tutorial will conclude with open issues and future directions of research.

Monday, June 11, 2012 • 14:00 – 18:00

Radio Resource Management in Femtocell Network

Instructors: Ekram Hossain, University of Manitoba, Canada
Long Bao Le, University of Quebec, Canada

The evolving femtocell networks are envisioned to provide improved capacity and coverage in next generation cellular wireless systems. Femtocell deployments pose many challenges among which radio resource management (i.e., interference management, admission control, load balancing) is the most significant one. The aim of this tutorial is to provide an extensive overview of the radio resource management problem in femtocell networks considering both CDMA (e.g., 3G) and OFDMA (e.g., LTE, WiMAX) femtocells, and the state-of-the-art research on this topic. After a brief overview of the femtocell networks, we outline the major challenges in successful deployment of femtocells in next generation cellular wireless systems. In particular, the challenges related to resource allocation, co-tier and cross-tier interference management and admission control, mobility and handoff management, auto-configuration, timing and synchronization, and security are discussed. Then we provide a comprehensive overview of the different state-of-the-art techniques for resource allocation and interference management in femtocell networks. In this context, the interference modeling approach based on the shot-noise theory is also discussed. We consider both CDMA and OFDMA femtocells and two different approaches for resource allocation and interference management in these systems are described. The requirements and challenges for admission control and load balancing in femtocell networks are then discussed, and an example method for joint admission control and load balancing is given.

For further updates, visit www.ieee-icc.org/tutprogram.html.

Friday, June 15, 2012 • 08:30 – 12:30

Inter-Vehicular Communication: Standards, Protocol Design, and Integrated Security Metrics

Instructors: Falko Dressler, University of Innsbruck, Austria
Claudio Casetti, Politecnico di Torino, Italy

This tutorial covers the most recent progress in Inter-Vehicular Communication. In a first part, we investigate the requirements on IVC ranging from traffic information systems to safety applications with real-time communication constraints. Typical IVC approaches are introduced including fully distributed as well as infrastructure-based, and centralized 3G/4G solutions. Emphasis is laid on the most recent standardization activities in the DSRC/WAVE context. We continue to discuss relevant protocols and communication principles to provide detailed information on which communication methods can be applied and how IVC protocols are developed. We study ad hoc routing approaches and their limitations to cover wide areas as well as recent geo-routing and broadcast-based data dissemination techniques. The main focus, however, will be on recently developed beaconing approaches that can easily be built upon the IEEE 802.11p protocol standard. The second part of the tutorial will focus on Secure IVC. Relying on broadcast transmissions, IVC solutions are exposed to multiple threats. Attacks are not easily prevented because of the ephemeral nature of IVC links and the constant movement of vehicles, as well as by the stringent timing requirements of IVC applications. We discuss the vulnerabilities of IVC solutions in terms of identity management, message authentication/protection/consistency, privacy protection and in-vehicle security. This overview will provide attendees with the state of the art as well as the open challenges in the field of secure IVC.

Friday, June 15, 2012 • 08:30 – 12:30

New Frontiers in Opportunistic Communication

Instructor: Aria Nosratinia, University of Texas, Dallas, USA

Opportunistic communication is a simple but effective method of leveraging multiple fading realizations to make the best instantaneous use of wireless resources. This simple idea has found many manifestations, from multi-user diversity to antenna selection to relay selection. Moreover, recent developments hint that opportunistic methods may find a wider breadth than previously thought. This tutorial outlines the principles, tools, and applications of opportunistic communication, with special attention to potential future developments and research directions. The tutorial begins with a historical background and explores the classical multi-user diversity and its extensions. Various aspects of this problem, including limited feedback, will be discussed. Relay selection is another important instance of opportunistic communication. An outline of known results in relay selection will be presented and potential future directions will be discussed. The related area of MIMO antenna selection will be visited. Finally two advanced topics will be presented: first, new results will be presented that allow the extension of opportunistic communication and its analysis to network topologies that previously could not be analyzed under multiuser diversity, for example the broadcast relay channel. Second, the application of multiuser diversity in cognitive radio will be discussed.

Friday, June 15, 2012 • 08:30 – 12:30

Remote Wellbeing Monitoring in 4G Networks

Instructors: Abd-Elhamid M. Taha, Alfaisal University, Saudi Arabia
Najah Abu Ali, United Arab Emirates University, UAE
Hossam S. Hassanein, Queen's University, Canada

The impacts of Remote Wellbeing Monitoring (RWM) extend beyond basic lifestyle gains to reach serious humane and economic consequences. The upcoming IMT-Advanced or 4G technologies will empower RWM services with substantial improvements through the use of advances such as multi-carrier access techniques, MIMO, flat architectures, small cells and convergence to all-IP networks. 4G access also promises a "greener" mobile user experience. Deployment of RWM over 4G networks, however, is not without challenges. As a network service, RWM may have stringent constraints in terms of Quality of Service (QoS), reliability and security. The nature of RWM traffic is also mixed (delay-constrained data streams, high resolution images, videos, etc.), and require particular attention from service providers given that lives might be at stake. The tutorial starts with motivating RWM services, offering an up-to-date view of the industry and the market status. It then details the technical requirements of RWM in terms of overall system design, system components, and network considerations. A primer is then provided for IMT-Advanced networks, taking 3GPP's LTE-Advanced as an example. We review technologies and advances enabling the realization of 4G access networks. Finally, an overview of the research challenges facing dense deployment of RWM services will be given.

For further updates, visit www.ieee-icc.org/tutprogram.html.

Friday, June 15, 2012 • 14:00 – 18:00

Mobile-Station and Base-Station Cooperation for Wireless Communications

Instructor: Lajos Hanzo, University of Southampton, UK

The limitations of MIMOs relying on co-located array-elements are highlighted and it is shown, how the single-antenna-aided cooperative mobiles may circumvent these limitations by forming MIMOs having distributed elements. This concept is also referred to a Virtual Antenna Arrays (VAA). Then the corresponding amplify-forward and decode-forward protocols as well as their hybrids are studied. Channel coding has to be specifically designed for the VAAs in order to prevent avalanche-like error-propagation. Hence sophisticated three-stage-concatenated iterative channel coding schemes are proposed and it is argued that in the absence of accurate channel information at the relays the best way forward might be to use multiple-symbol differential detection. Indeed, it is rather unrealistic to expect that an altrustically relaying handset would also accurately estimate the source-relay channel for the sake of high-integrity coherent detection. EXIT-chart-aided designs are used for creating near-capacity solutions and a range of future research directions as well as open problems are stated.

Friday, June 15, 2012 • 14:00 – 18:00

Disruption/Delay Tolerant Mobile I Ad Hoc Networks

Instructor: Zhensheng Zhang, Boeing, USA

In mobile ad hoc networks, nodes are constantly in motion and/or operate on limited power. When nodes are in motion, links can be obstructed by intervening objects. To conserve power, links are shut down periodically, resulting in intermittent connectivity. Applications in intermittent connected networks must tolerate delays beyond conventional IP forwarding delays and these networks are referred to as delay/disruption tolerant networks (DTN). New protocols specifically for DTNs must be developed as existing protocols designed for the Internet do not work properly. In this tutorial, we will review different DTN architectures and different protocol stacks proposed, the Bundle Protocol (BP), the Convergence Layer (CL) protocols such as Licklider transmission protocol (LTP)-CL, TCP-CL and UDP-CL. We will also review the state of the art in routing in DTNs and categorize these routing protocols based on information used. Recent developments in erasure coding, network coding and social networks applied to DTNs are also described. New architectures for vehicular DTNs are presented. Applications of DTNs in machine to machine and off loading traffic from cellular networks are discussed. The tutorial also identifies open research issues and intends to motivate new research and development in this area.

Friday, June 15, 2012 • 14:00 – 18:00

Network Coding: From Theory to Practice

Instructors: Frank H. P. Fitzek, University of Aalborg, Denmark
Muriel Médard, Massachusetts Institute of Technology, USA

The tutorial provides an introduction to the rapidly growing research area of network coding. Network coding allows intermediate nodes in a network to manipulate data, for example by sending out packets that are combinations of previously received packets instead of simply forwarding them. The initial theoretical results on network coding were followed by a wealth of applications in a number of different areas that show that the theoretical insights can be translated into practical gains.

The tutorial is divided into three parts. The first part provides the participants with the theoretical tools necessary to understand the field of network coding and focuses on the underlying algebraic principles. It will also introduce distributed randomized network codes and discuss their properties. We will not assume any prior knowledge of advanced algebra or optimization. The second part of the tutorial gives an overview of the different application areas and discusses, which types of networking problems are amenable to network coding (and which aren't). Finally, we will discuss implementation aspects in real-world systems. Such systems may range from core network routers all the way down to mobile phones and tiny sensor nodes.

For further updates, visit www.ieee-icc.org/tutprogram.html.

Sunday, June 10 – Monday, June 11, 2012

(Standards) Telecommunications: From Research to Standards

Monday, June 11, 2012

Half Day Workshops

08:30 – 12:30

- **(AMN)** Advances in Mobile Networking - Towards a Next Generation Mobile Core Network
- **(MoNaCom)** Molecular and Nanoscale Communications

14:00 – 18:00

- **(Storage)** Emerging Data Storage Technologies

Full Day Workshops

08:30 – 18:00

- **(WIVN)** Intelligent Vehicular Networking: V2V/V2I Communications and Applications
- **(CloudNetsDC)** Clouds, Networks and Data Centers
- **(GreeNet)** Cognitive Radio and Cooperation for Green Networking
- **(CONWIRE)** Convergence among Heterogeneous Wireless Systems in Future Internet
- **(Netsurviv)** New Trends in Optical Networks Survivability
- **(U-NET)** User-Centric Networking
- **(CoCoNet4)** Cooperative and Cognitive Mobile Networks
- **(E2Nets)** Energy Efficiency in Wireless Networks & Wireless Networks for Energy Efficiency
- **(FutureNet V)** Network of the Future
- **(SCPA)** Smart Communication Protocols and Algorithms - Summer
- **(SaCoNet-III)** Smart Communications in Network Technologies

Special Interest Workshop:
Humanitarian Communication Applications: Solutions for the Next Billion People

Friday, June 15, 2012

Half Day Workshop

08:30 – 12:30
(EHC) Energy Harvesting for Communication

Full Day Workshops

08:30 – 18:00

- **(WiSAAN)** Wireless Sensor Actor and Actuator Networks
- **(ViOpt)** Realizing Advanced Video Optimized Wireless Networks
- **(LTHE)** Long Term HSPA Evolution
- **(MobiCHeSS)** Mobile Consumer Health Care Networks, Systems and Services
- **(NovaEnEv)** Novel Approaches to Energy Measurement and Evaluation in Wireless Networks
- **(RIDO)** Re-think ICT Infrastructure Designs and Operations ~ Disaster Recovery Lessons Learned from Great East Japan Earthquake
- **(RSN)** Radar and Sonar Network
- **(SDN)** Software Defined Networks
- **(GCN)** Green Communications and Networking
- **(SFCS)** Security and Forensics in Communication Systems
- **(SmallNets)** Small Cell Wireless Networks

For further updates, visit www.ieee-icc.org/workshopprogram.html.

REGISTRATION

PARTICIPANT CATEGORY	EARLY (On or before April 12, 2012)	LATE (After April 12, 2012)
Full Program	**USD**	**USD**
IEEE ComSoc or Sister Society Member	Includes a paperless+ Conference Device (tablet)	
R01 – Full	$890	$1015
R02 – Limited	$690	$815
R03 – One Day (Tue, Wed or Thu)	$505	$590
IEEE (Non-ComSoc or Sister Society) Member	Includes a paperless+ Conference Device (tablet)	
R04 – Full (1)	$915	$1040
R05 – Limited (2)	$715	$840
R06 – One Day (Tue, Wed or Thu)	$530	$615
Prospective Member / Non-Member	Includes a paperless+ Conference Device (tablet)	
R07 – Full (1)	$1170	$1350
R08 – Limited (2)	$970	$1150
R09 – One Day (Tue, Wed or Thu)	$715	$850
SPECIAL CATEGORIES	paperless+ Conference Device (tablet) is Optional	
R10 – IEEE Life Member	$50	$50
R11 – IEEE Student Member	$310	$370
R12 – Prospective / Non-member Student	$385	$460
R13 – Workshop(s) Only (each)		
Special Interest (SI1) & 1/2 –day	$250	$350
One (1)-Day	$350	$450
MF1-Two (2) Day	$550	$650
R14 – Tutorial(s) Only (each ½ day)**	$250	$350
R15 – Industrial Forum (IF) & Exhibition Only		
R15a-One Day	$200	$250
R15b-Three Day	$450	$550
R16 – Accompanying Person***	No fee; however, use a separate form	
R17 – Tablet for R10 to R15 categories	$235	
R18 – Tablet for R16 category	$300	
EX05 – Exhibit Only Pass (each)	$200	
EX06 – Tablet Upgrade to 32GB	$116	
EX07 – Tablet Upgrade to 64GB	$232	

1) **R04, R07**, includes complementary IEEE ComSoc membership (digital delivery of IEEE Communications Magazine)
2) **R05, R08**, includes complementary affiliate ComSoc membership (digital delivery of IEEE Communications Magazine)
****The Full and Limited (R01-R02, R04-R05, R07-R08)** registration includes One-half day free Tutorial. Additional Tutorials require additional fees.
*****All Accompanying Persons** (i.e., Companion/Spouse) must complete separate registration form. Accompanying Persons have are not permitted in the symposia or forum sessions (see the Participant Category Benefits table for entitlements)

TUTORIALS & WORKSHOPS GENERAL NOTE
You may participate in the Tutorials and Workshops without participating in the rest of the conference. A one-half day tutorial is included with the FULL or LIMITED General participation categories and the Industrial Forums & Exhibition participation package (R01, R02, R04, R05, R07, R08, and R15, refer to the "Participant Categories Benefits" table).

paperless+ CONFERENCE DETAIL
IEEE ICC 2012 is a "paperless+ Conference." Conference materials – such as the program, proceedings, presentations, exhibition guide, newsletters, notices, etc.– will be in electronic form on a Blackberry Playbook 16GB.

The paperless+ conference application is optimized for viewing the documents on the device offered and via the web. You can use most smartphones (iPhone, Android 2.2+, Blackberry 6+), however, PDFs and Word documents may display differently.

Only one tablet is issued per participant.

To register online or download the registration form, visit www.ieee-icc.org/2012/registration.html.

VENUE

IEEE ICC 2012 will be held at the Ottawa Convention Centre (OCC).
All technical symposia, industry forums, keynote and panel sessions, workshops, tutorials and exhibitions will be hosted at the Ottawa Convention Centre.

HOTELS

The Westin Ottawa Hotel will serve as the conference headquarter hotel due to its direct connection and easy access to the Ottawa Convention Centre (conference venue).

Westin Ottawa Hotel
11 Colonel By Drive
Ottawa, ON K1N 9H4
+1 (613) 560-7000

Conference Rates:

2 Double Beds (Premium):	2 Double Beds (Traditional):	King Bed (Premium):	King Bed (Traditional):	King Bed (Deluxe):
CAD 239.00	CAD 239.00	CAD 239.00	CAD 239.00	CAD 279.00

Novotel Ottawa Hotel
33 Nicholas Street
Ottawa, ON K1N 9M7
+1 (613) 230-3033

Conference Rates:

Superior King
CAD 165.00

To reserve your accommodations, visit www.ieee-icc.org/2012/hotels.html.

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