International Conference on ICT Convergence 2015

ICTC 2015

"Innovations toward the IoT, 5G, and Smart Media Era"

October 28-30, 2015
Lotte City Hotel Jeju, Jeju Island, Korea

Final Program

Hosted by Ministry of Science, ICT and Future Planning

Ministry of Science, ICT and Future Planning

Organized by KICS The Korean Institute of Communications and Information Sciences · IEEE · IEEE SEOUL SECTION · IEICE Communications Society

Patronized by ETRI Electronics and Telecommunications Research Institute · IITP · KOFST THE KOREAN FEDERATION OF SCIENCE AND TECHNOLOGY SOCIETIES · SAMSUNG ELECTRONICS · kt · LG Electronics

QUALCOMM · ERICSSON · LG · INTERDIGITAL · GSI Multi-Screen Service Forum Society Safety System Forum

Jeju CVB Jeju Convention & Visitors Bureau · Jeju Special Self-Governing Province

ICTC 2015 — International Conference on ICT Convergence 2015

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Message from the Chairs

With great pleasure, we would like to welcome you to the 6th International Conference on Information and Communication Technology Convergence (ICTC 2015) being held in Jeju Island, Korea.

ICTC 2015 is one of the major international conferences on the topic of Information and Communication Technology (ICT) Convergence hosted by the Ministry of Science, ICT and Future Planning (MSIP), organized by The Korean Institute of Communications and Information Sciences (KICS) with technical co-sponsorship of IEEE Seoul Section & IEICE Communications Society, and patronized by leading ICT companies including ETRI, Samsung Electronics, LG Electronics, Qualcomm, KT, Ericsson-LG, InterDigital, Multi-Screen Service Forum, and so on.

ICTC 2015 features an extremely rich program with the main theme of "Innovations toward the IoT, 5G, and Smart Media Era". The attendees will have the opportunity to associate with the world's most distinguished industry leaders, researchers, government officials, and academia professionals in the areas of future wireless communications and networking, smart media & convergence services, smart devices & consumer appliances, healthcare and bio-informatics technologies.

During ICTC 2015, keynote speeches and special talks will be delivered by high level and prominent experts from ETRI, Samsung Electronics, LG Electronics, Qualcomm, Intel, Microsoft, Ericsson-LG, Huawei, Nokia, LG U+, KT, SKT, China Telecom, ARM, InterDigital, and so on. ICTC 2015 will also provide three day presentations of invited and regular papers from diverse groups of all around the world on topics of wireless & mobile communications, green communication technologies, Future Internet, information & communication theory, smart media & broadcasting, smart grid, u-health & bio-informatics, Internet of Things (IoT), machine-to-machine (M2M) communication, encryption & security, and much more towards the smart ICT convergence.

We cordially invite you to join us in Jeju Island from October 28th to 30th for this great ICT event and enjoy Jeju, known as the "Island of the Gods." We especially recommend you to visit and enjoy the natural World Heritage Sites, Jeju Volcanic Island and Lava Tubes.

We look forward to seeing you at ICTC 2015!

Jong-Seon No
KICS President

Jin Woong Kim
Organizing Committee Chair

Seong-Ho Jeong
Program Committee Chair

ICTC 2015 International Conference on ICT Convergence 2015

Program at a Glance

|							
October 28 (Wednesday), 2015							
Time	Foyer Room	Ruby Room	Culture Center Room 1	Culture Center Room 2	Crystal Ballroom 1	Crystal Ballroom 2	Crystal Ballroom 3
08:20-10:00	**Session I-1:** Advanced Wireless & Mobile Communication Systems and Infrastructure	**Session I-2:** Smart Grid and Energy/ Power-Aware Technologies & Applications	**Session I-3:** u-Healthcare Systems, and Bio-informatics & Its Applications	**Session I-4:** Systems, Services, and Applications for ICT Convergence	**Session P-1:** Poster Session 1	**Workshop I:** Enabling Techniques for Future Mobile Communications (5G/6G) Part I	**Special Session I:** IoT Platforms (Invited Talks)
10:00-10:30	Coffee Break						
10:30-12:00	**Plenary Session I: Opening and Keynote Speeches** (Crystal Ballroom) •Future Vision and Key Enabling Technologies for IoT Dr. Jong-Deok (JD) Choi, Executive Vice President, Samsung Electronics •The Future of Mobile Computing and Communications toward the 5G/6G Era Dr. Geng Wu, CTO, Intel Fellow, Intel Corporation •Opening Address - Dr. Jong-Seon No, President of KICS •Welcome Address - Dr. Yanghee Choi, Minister of MSIP						
12:00-13:30	Lunch						
13:30-15:30	**Industrial Session I: Technologies and Devices for the Networked Society (Invited Talks)** (Crystal Ballroom) •Technologies for the Networked Society Dr. Youngjoon Kim, Senior Vice President, Head of R&D, Ericsson-LG •Evolution of LTE-Advanced in 3GPP Rel-13/14: a Path to 5G Dr. Juho Lee, Master (VP), Samsung Electronics •New Technologies for Next Gen Mobile Devices Dr. Te-Won Lee, President, Qualcomm						
15:30-16:00	Coffee Break						
16:00-17:40	**Session II-1:** SDN and Network Function Virtualization	**Session II-2:** Advanced Wireless & Mobile Communication Systems and Infrastructure	**Session II-3:** Smart Media & Broadcasting, and Smart Devices/ Appliances	**Session II-4:** Mobile/Wireless Technologies and Indoor Positioning/ Navigation Systems	**Session II-5:** Emerging Issues in Communications	**Workshop II:** Enabling Techniques for Future Mobile Communications (5G/6G) Part II	**Special Session II:** IoT Connectivity (Invited Talks)
18:00-19:00	Welcome Reception						
October 29 (Thursday), 2015							
Time	Foyer Room	Ruby Room	Culture Center Room 1	Culture Center Room 2	Crystal Ballroom 1	Crystal Ballroom 2	Crystal Ballroom 3
09:00-10:40	**Session III-1:** Advanced Wireless & Mobile Communication Systems and Infrastructure	**Session III-2:** M2M/IoT/ IoE/WoT Communication Infrastructure and Applications	**Session III-3:** Services/ Applications and Smart Media/ Devices	**Session III-4:** Advanced Communication Networks and Future Internet Technologies	**Session P-2:** Poster Session 2	**Session III-5:** Emerging Signal Processing Techniques for Wireless Communications and Storage	**Special Session III:** 5G Requirements and Enabling Technologies (Invited Talks)
10:40-11:00	Coffee Break						
11:00-12:00	**Plenary Session II: Keynote Speeches** (Crystal Ballroom) •SK Telecom's Mobile Broadband Innovation for the Value-Creating Network Mr. Jin-Hyo Park, Senior Vice President, SK Telecom •Future Media Services and Technologies for a Smart Society Mr. Colin Nurse, Chief Technology Officer, Microsoft						
12:00-13:10	Lunch						

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Program at a Glance

Time	Foyer Room	Ruby Room	Culture Center Room 1	Culture Center Room 2	Crystal Ballroom 1	Crystal Ballroom 2	Crystal Ballroom 3
October 29 (Thursday), 2015							
13:10-15:10	**Industrial Session II: Spectrum, Systems, and Technologies for the 5G Era (Invited Talks)** (Crystal Ballroom) •The Virtuous cycles of Spectrum, Economy, Engineering, and Theory toward the 5G Era Dr. Byung K. Yi, Executive Vice President, InterDigital •Huawei 5G Vision and Progress Dr. Tsuyoshi Kashima, CTO, Mobile Network, Huawei Technologies, Japan •5G Mobile Communication System and Enabling Technologies Dr. Byoung-Hoon Kim, Vice President, LG Electronics						
15:10-15:30	Coffee Break						
15:30-17:10	**Session IV-1:** Encryption and Security for ICT Convergence	**Session IV-2:** D2D Discovery and Communications	**Session IV-3:** IoT/IoE/ M2M/WoT Communication Infrastructure and Applications	**Session IV-4:** Advanced Wireless & Mobile Communication Systems and Infrastructure	**Workshop III:** Future Coding Techniques for Next Generation Networks	**Session IV-5:** Smart Radio and Cognitive Radio	**Special Session IV:** Smart Media for the 5G Era (Invited Talks)
18:00-20:00	Banquet (Best Paper Awards, KICS Dr. Irwin Jacobs Award, Performance)						

Time	Foyer Room	Ruby Room	Culture Center Room 1	Culture Center Room 2	Crystal Ballroom 1	Crystal Ballroom 2	Crystal Ballroom 3
October 30 (Friday), 2015							
08:30-10:10	**Session V-1:** ICN, CDN, CCN, DTN	**Session V-2:** Information & Communication Theory and Applications	**Session V-3:** Big Data, Mobile Cloud Computing, and Advanced Networks	**Session V-4:** Vehicular Networks and Security	**Session V-5:** Emerging Issues in Networking	**Session V-6:** Systems, Services and Applications for ICT Convergence	**Special Session V:** Mobile Systems (Invited Talks)
10:10-10:30	Coffee Break						
10:30-11:00	**Plenary Session III: Keynote Speech** (Crystal Ballroom) •Intelligent and Connected: Moving forward in IoT Dr. Krisztián Flautner, General Manager, Internet of Things (IoT) Business, ARM						
11:00-11:10	Break						
11:10-12:50	**Session VI-1:** Advanced Communication Networks and Future Internet Technologies	**Session VI-2:** Vehicular Networks and Mobile Networks	**Session VI-3:** WLAN, WPAN, WBAN, and MANET	**Session VI-4:** Mobile Cloud Computing & Communication Systems and Applications	**Session VI-5:** Spectrum Sharing Towards 5G and IoT	**Session VI-6:** Advanced Wireless & Mobile Communication Systems and Infrastructure	**Special Session VI:** SDN & NFV (Invited Talks)

Registration Hours

Oct. 28 (Wednesday) 07:50 - 18:00 | Oct. 29 (Thursday) 07:50 - 18:00 | Oct. 30 (Friday) 07:50 – 12:00

ICTC 2015
International Conference on ICT Convergence 2015

Session Room Locations

4th Floor

VIP Room

Crystal Ballroom 1

Crystal Ballroom 2

Ruby Room

Crystal Ballroom 3

Foyer

5th Floor

Stairs

Culture Center Room 1

Culture Center Room 2
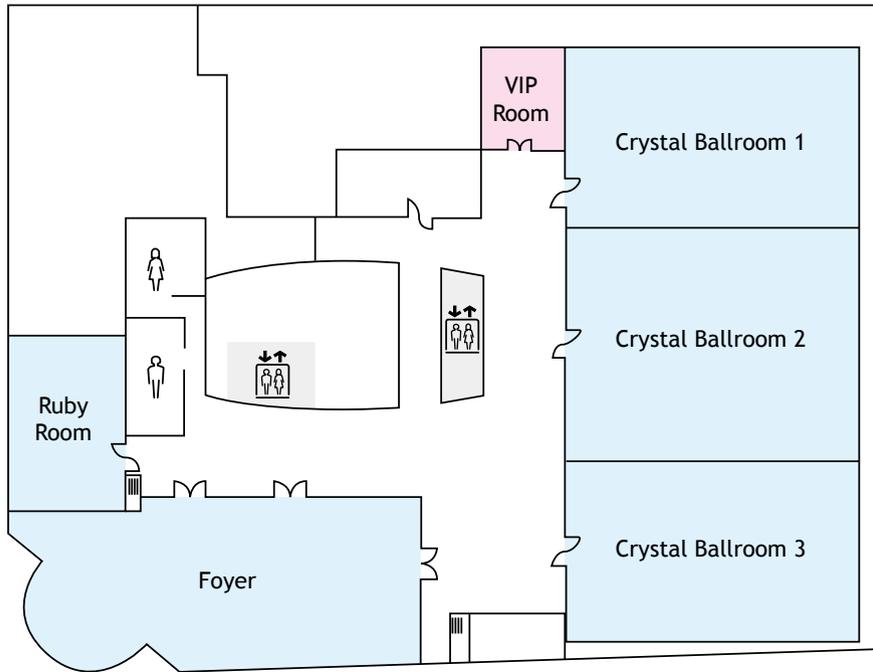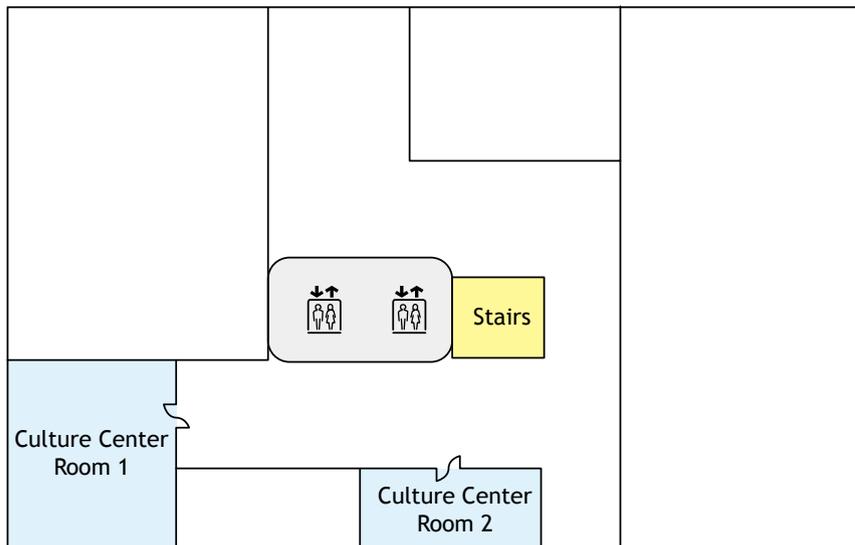
Plenary Sessions

October 28 (Wednesday), 2015

Plenary Session I: Opening and Keynote Speeches

Crystal Ballroom, 4th fl., 10:30-12:00

Time	Title	Invited Speakers
10:30-12:00	Keynote Speech 1: "Future Vision and Key Enabling Technologies for IoT"	Dr. Jong-Deok (JD) Choi Executive Vice President Samsung Electronics
	Keynote Speech 2: "The Future of Mobile Computing and Communications toward the 5G/6G Era"	Dr. Geng Wu CTO and Intel Fellow Intel Corporation
	Opening Address	Dr. Jong-Seon No President of KICS
	Welcome Address	Dr. Yanghee Choi Minister of MSIP

Keynote Speech 1: "Future Vision and Key Enabling Technologies for IoT"

Dr. Jong-Deok (JD) Choi, Executive Vice President, Samsung Electronics

Abstract:

Today, Internet of Things (IoT) is a reality of the world-wide IT industry and is being accelerated rapidly. Analysts predict that more than several hundred billion connected 'Things' will be in use globally by the end of 2020. The IoT is on track to become the primary enabling technology for digital business reaching many different products and services. The three driving components for the IoT technology are devices, connectivity among them, and services on top of these interconnected devices. The device technology covers from traditional devices like desktop and laptop computers, handheld mobile devices to a diverse range of sensors and everyday small things. The connectivity technology enables communication among various devices and allows them to interact with the external environment. An IoT device senses its surrounding environment, analyzes the gathered data, then carry out context-sensitive actions for offering the right service. Samsung has been leading the cutting-edge research in these three areas (devices, connectivity and services) to create solutions that effectively respond to challenging requirements of the IoT market. These solutions will be continuously improved and new solutions will be developed by collaborative partnerships between Samsung and other major IoT players. Through the industry collaboration, Samsung will be able to provide better user experience and smarter environment where different devices from various industries are seamlessly connected. Samsung is committed to deliver new value to everyone's daily life on its grand vision for IoT. By 2020, the entire Samsung devices will be IoT-enabled. However, it will take more than one organization or industry leader to unlock the full potential of IoT. Collaboration crossing different IT industries is a must in order to reach its fullest potential.

Biography:

Dr. Jong-Deok (JD) Choi serves as Executive Vice President of Samsung Electronics Co., Ltd. He currently manages Samsung Software R&D Center (SWC). His primary responsibility includes leading all development aspects of the Tizen Open Source Platform for Samsung devices ranging from smart phones, tablets, and IVI (In-Vehicle Infotainment). As a founder and the President of Open Interconnect Consortium (OIC) - global industry group of more than 90 member companies including CISCO, GE, Intel, IBM, HP, Dr. Choi drives global industry consolidation of the Internet of Things (IoT) around common interoperable standards and open source solutions (http://openinterconnect.org/). Prior to Samsung, Dr. Choi has held a variety of research and management positions at IBM T. J. Watson Research Center. With more than 20 years of research in the areas of compiler and system debugging technologies, he has numerous publications and patents on interprocedural dataflow analysis, pointer analysis, escape analysis of threads, extent analysis of Java, execution replay, and datarace detection.

Plenary Sessions

Keynote Speech 2: "The Future of Mobile Computing and Communications toward the 5G/6G Era"

Dr. Geng Wu, CTO of Wireless Standards and Intel Fellow, Intel Corporation

Abstract:

The evolution of high speed wireless and Moore's Law are on an intersect course. Together, they are enabling the infusion of computing and connectivity into virtually anything, giving rise to the Internet of Things. Intel's pioneering efforts in NFV, virtualized RAN, and small cells enabled next-generation core and access networks. Intel's design and manufacturing technologies enabled mobile devices to continue to evolve in size, form, function and computing capability to give us many new categories of devices, such as wearables, connected automobiles, connected home appliances, smart cities and other applications. Today wireless industry is at a turning point. On wireless communication technologies, further improving spectral efficiency at individual radio link level is becoming increasingly challenging. We need to find new ways to build our future networks and devices to meet our ever increasing capacity demands. On services and applications, as smartphone penetration accelerating globally and starting to saturate in many developed markets, we need to develop new technologies that make things smarter, our daily work more efficient and our living environment intelligent. On user experience, we need to create a technology foundation that enables future generations of applications and services for the coming decades that are likely beyond what we could imagine today. To achieve these goals, 5G and future generations of networks and devices are about the combination of computing and communications, and about end-to-end solutions. This is a paradigm shift from previous generations where technology development focused primarily on communications. In this new 5G era, Intel is uniquely positioned in the world with its breadth and depth of design expertise, engineering capability and scale in both computing and communications. This presentation will discuss this paradigm shift and what it means to the industry, key challenges and opportunities, and future research directions. It will highlight Intel's technology vision for future mobile computing and communications. This is a mission of unprecedented global scale. It requires many industries to work together and innovate, governments to change regulations, and academic research community to come up with new technology breakthroughs. Intel has a long history of partnership with Korean high-tech industries and research communities, from network virtualization, cloud RAN to air interface technologies. Recent SKT-Intel joint demonstration of anchor-booster network architecture for mmWave communication at MWC 2015 offered an early taste of what 5G performance could offer to end users. And there are more to come.

Biography:

Dr. Geng Wu is an Intel Fellow and CTO of Wireless Standards, Intel Corporation. He currently leads Intel's global 5G wireless technology development and ecosystem standards collaborations. Dr. Wu has more than 20 years of research and development experience in the wireless industry. He has contributed extensively to global 2G CDMA, 3G 1xRTT/UMTS/ HSPA and 4G WiMAX/LTE radio interface and network architecture design and development. His current research interests include future mobile computing and communication platforms, network function and mobile device computing virtulization, radio channel modeling, next-generation air interface technologies, and user experience for mobile services and applications. Before joining Intel, Dr. Wu served as Director of wireless architecture and standards at Nortel Networks, where he was responsible for system performance, standards research, and technology development in 3GPP2, 3GPP, IEEE and WiMAX. Dr. Wu received his Ph.D. in telecommunications from Université Laval in Québec, Canada; and his bachelor's degree in Electrical Engineering from Tianjin University in Tianjin, China. He has been issued more than 30 U.S. patents, and authored or co-authored 40 research publications in the field of mobile wireless communications and networking.

Plenary Sessions

October 29 (Thursday), 2015

Plenary Session II: Keynote Speeches

Crystal Ballroom, 4th fl., 11:00-12:00

Time	Title	Keynote Speakers
11:00-12:00	Keynote Speech 3: "SK Telecom's Mobile Broadband Innovation for the Value-Creating Network"	Mr. Jin-Hyo Park Senior Vice President Head of Network Technology R&D Center SK Telecom
	Keynote Speech 4: "Future Media Services and Technologies for a Smart Society"	Mr. Colin Nurse Chief Technology Officer Microsoft

Keynote Speech 3: "SK Telecom's Mobile Broadband Innovation for the Value-Creating Network"

Mr. Jin-Hyo Park, Senior Vice President, Head of Network Technology R&D Center, SK Telecom

Abstract:

As the world's most innovative mobile service provider, SK Telecom is creating the future of mobile and delivering cutting-edge, converged wireless technologies for the global market. The company is a pioneer in the mobile industry, having been the first to launch and commercialize CDMA, 3G CDMA, 3.5G HSDPA among other mobile services, and is now leading the way in 4G and beyond. This presentation will cover what SK Telecom has done so far to bring a true mobile broadband experience into our life. In addition to CDMA, WCDMA, HSDPA, and HSPA+, SK Telecom launched the nation's first LTE service in July 2011. SK Telecom also became the world's first mobile carrier to commercialize 150Mbps LTE-Advanced in June 2013 and 225Mbps LTE-Advanced in June 2014 through Carrier Aggregation (CA). In line with its efforts to swiftly move towards the next-generation mobile network system including 5G, it successfully commercialized 300Mbps tri-band LTE-A CA. SK Telecom will also present the view and strategy on the network evolution to prepare more accelerated mobile broadband in the future. The future network needs to accommodate more and more data traffic efficiently and enable new valued services. To achieve this goal, SK Telecom proposes four directions in network evolution, "Simple", "Unified", "Responsive", and "Enhanced". Based on the four directions, the future network can take many advanced technologies, e.g., virtualization, analytics, ultra-dense network, etc., and it should be "Value-Creating Network". In line with network evolution, SK Telecom is seeking new growth engines through three innovative platforms namely Lifestyle Enhancement Platform, Advanced Media Platform and IoT Service Platform. Finally, this presentation will discuss the 5G network and services. SK Telecom holistically defines 5G as end-to-end network architectures and services, promising the greater values in terms of (1) user experience, (2) connectivity, (3) reliability, (4) efficiency, and (5) intelligence. Based on the ultra-fast speed, massive connectivity, and platformized valued network, many new services will be coming up (e.g., immersive virtual experience, massive/mission-critical IoT, etc.).

Biography:

Mr. Jin-Hyo Park is Senior Vice President and Head of Network Technology R&D Center of SK Telecom. He is currently responsible for the development of wireless technologies at SK Telecom. He joined SK Telecom in 1997, and worked for the IRIDIUM project and 3GPP standardization. From 2004, he has not only contributed to the commercialization of WCDMA and HSDPA/HSUPA, but also took a responsibility for the R&D strategy of SK Telecom. Since 2009, he has successfully led the Korean first LTE launch, the world-first multi-carrier deployment, the world-first nation-wide HD Voice (VoLTE) commercialization, and the world-first LTE-A (Carrier Aggregation) commercialization, and he is now directing LTE evolution and beyond LTE-A of SK Telecom. His current interest mainly focuses on advanced communication systems including LTE-A, B4G(5G), NFV/SDN, and Network Analytics. He received a Bachelor's degree in Mathematics and a Master's degree in Information & Communication Engineering from Korea University.

Plenary Sessions

Keynote Speech 4: "Future Media Services and Technologies for a Smart Society"

Mr. Colin Nurse, Chief Technology Officer, Microsoft

Abstract:

The retail Industry is struggling to compete with the online retailers. It is a common place scene now to see consumers look at instore products to see touch and feel the products and then look online for pricing. Ensuring the in-person shopping experience is in line with what modern consumers expect to see, the traditional stores are responding back with smart media, wireless technologies and consumer history directing consumers to products that the consumer wants at a price they can afford. Improvements in the smart media and Wireless are providing the platform for the modern retail experience outside and inside the traditional store.

Biography:

Mr. Colin Nurse's role as Chief Technology Officer for Microsoft's Global & Multi National Accounts organization is to engage with Microsoft's very best enterprise customers and their use of new products and services to address their current and future business needs. The objective of the GAO/MNC CTO role is to provide "trusted advisor" support for the major IT strategies and customer business transformations by utilizing technology and modern IT to address the customer's key business objectives. Colin has IT business, architecture and global IT service delivery skills that focus on unified communications, IT consolidation and the provision of new hosted services. Typically, the non-technical issues are the hardest to work through. From personal experiences, Colin has led many successful projects to support how to help solve blockers and successful transitions that provide benefits to the customer's business. Colin is located at Microsoft's headquarters in Redmond, WA which enables him to provide two-way communication exchange between customers, industry experts, Microsoft field teams, and engineering groups based in Redmond. Colin is a business focused IT professional with a track record of delivering and executing enterprise IT strategies that provide major business benefits through significant cost reduction, service enhancement and provision of new IT services through process re-engineering and adoption of new technologies. He brings with him years of IT experience with in-depth business knowledge of the Public Sector, Justice and Public Safety, DOD, Pharmaceutical, Manufacturing, SaaS and Higher Educational industries.

Plenary Sessions

October 30 (Friday), 2015

Plenary Session III: Keynote Speech

Crystal Ballroom, 4th fl., 10:30-11:00

Time	Title	Keynote Speakers
10:30-11:00	Keynote Speech 5: "Intelligent and Connected: Moving forward in IoT"	Dr. Krisztián Flautner General Manager Internet of Things (IoT) Business ARM

Keynote Speech 5: "Intelligent and Connected: Moving forward in IoT"

Dr. Krisztián Flautner, General Manager, Internet of Things (IoT) Business, ARM

Abstract:

The Internet of Things (IoT) is already here and in use today. With existing leadership in board installation base of Cortex-M, we have seen that IoT runs on ARM as the try reality. However, one size does not fit all in the IoT space; from gateways to rich end nodes and tiny, low cost sensor nodes. It is required to provide a diversity of hardware with a common software framework. The breadth and diversity of ARM technology, combined with ARM's collaborative business approach, meets the technical and market needs of rapidly evolving, secured interconnectivity of IoT. ARM's vision is an IoT architecture based on open, web-based standards from which innovation across ecosystems can flourish to enable new products, services and businesses. It is believed that security, wireless connectivity, low cost will be the key drivers to move IoT to the next stage.

Biography:

Dr. Krisztián Flautner is the General Manager of ARM's Internet of Things (IoT) business. Prior to this role, he was Vice President of R&D at ARM. He leads a global team that is focused on new business opportunities and the proliferation of the ARM architecture for IoT. He received a Ph.D. degree in Computer Science and Engineering from the University of Michigan, USA. He is a member of the ACM and the IEEE.

Industrial Sessions

October 28 (Wednesday), 2015

Crystal Ballroom, 4th fl., 13:30-15:30

Industrial Session 1: Technologies and Devices for the Networked Society

Chair: Dr. Sunghyun Choi, Professor, Seoul National University

SessionTime	Title	Invited Speakers
13:30-15:30	Technologies for the Networked Society	Dr. Youngjoon Kim Senior Vice President Head of R&D, Ericsson-LG
	Evolution of LTE-Advanced in 3GPP Rel-13/14: a Path to 5G	Dr. Juho Lee Master(VP) Samsung Electronics
	New Technologies for Next Generation Mobile Devices	Dr. Te-Won Lee President Qualcomm

Invited Talk 1: "Technologies for the Networked Society"

Dr. Youngjoon Kim, Senior Vice President, Head of R&D, Ericsson-LG

Abstract:

After a speedy evolution of mobile network and mobile industry from the 1st generation of voice communication to the recent 4th generation of LTE with data communication, 5G is one of the globally hot topics recently. ITU-R, 3GPP and other standard bodies recently started discussion on 5G standards. METIS, 5GPPP, IMT2020PG, Future forum, 5GMF and 5G forum collaborate for their 5G technology leadership. This talk introduces the Networked Society vision realized with 5G technologies. The Networked society will be depicted with the life style change, industry trend and application evolution. In addition, the requirements for Networked Society will be investigated. The 5G technology is described as a supporting technology for the realization of the Networked Society. 5G technology developments are not limited to the wireless communication itself but also network architecture, device, application, management and eco-system. This talk shows the 5G technology evolution status and direction with candidate technologies from the perspective of access/network technology and global harmonization.

Biography:

Dr. Youngjoon Kim is currently Senior Vice President of Ericsson-LG and Head of R&D. And he is a leadership member of Ericsson North East Asia R&D. Before joining Ericsson-LG, He held the position as Head of R&D LG-Nortel from 2008. He was named Vice President in 2002 and responsible for Mobile Communication Research Division, LG-Electronics Korea. From 2000, he has led several global joint R&D projects with Alcatel-Lucent, Nortel, LG-Electronics and Korea Government. He received his Ph.D. degree in Computer Science from Korea University.

Invited Talk 2: "Evolution of LTE-Advanced in 3GPP Rel-13/14: a Path to 5G"

Dr. Juho Lee, Master (VP), Samsung Electronics

Abstract:

The wireless cellular network has been one of the most successful communications technologies of the last three decades. Following the great commercial success of LTE-Advanced as the fourth generation (4G) networks, the research community is now increasingly looking beyond 4G and into future 5G technologies both in standardization

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body such as 3GPP, and in research projects such as the EU FP7 METIS. While today's commercial 4G LTE-Advanced networks are mostly deployed in legacy cellular bands up to 3.5 GHz, the mobile industry is looking forward to utilizing any spectrum opportunities below 100 GHz in 5G, including existing cellular bands, new bands below 6 GHz, and new bands above 6 GHz including the so-called mmWave bands. It is expected that decisions for new spectrums below 6 GHz and above 6 GHz would be made in World Radio-communication Conference (WRC)-2015 and in WRC-2019, respectively. From a technology evolution perspective, two parallel paths are expected to take place for evolution towards 5G. The first path is the continued evolution of LTE-Advanced in Rel-13/14 and beyond in a backward compatible manner with the goal of improving system performance in the bands below 6 GHz. The second path is to develop a new RAT which is not limited by backward compatibility requirements and can integrate breakthrough technologies to achieve best possible performance. The "new RAT" track is also expected to have a scalable design that can seamlessly support both above and below 6 GHz bands. This talk will focus on a set of important features of LTE-Advanced that are expected to be specified in 3GPP Rel-13/14. The features that would already be specified in Rel-13 include Full Dimension MIMO (FD-MIMO) for drastic increase of spectral efficiency via use of a large number of antennas at the base station, Licensed Assisted Access (LAA) for utilizing unlicensed spectrum while guaranteeing coexistence with existing devices, carrier aggregation with up to 32 component carriers, and further cost reductions for MTC devices that can also support extended coverage. While Rel-13 features would naturally be further enhanced in Rel-14, it is already anticipated that latency reduction and technologies for vehicle-related services (V2X) would become important features in Rel-14.

Biography:

Dr. Juho Lee is currently a Master with Samsung Electronics and is the lead executive in charge of research on standardization of wireless communications. He received his B.S., M.S., and Ph.D. degrees in electrical engineering from Korea Advanced Institute of Science and Technology (KAIST), Korea, in 1993, 1995, and 2000, respectively. He joined Samsung Electronics in 2000 and has been working on standardization of mobile communications for 3G and 4G such as WCDMA, HSDPA, HUSPA, LTE, and LTE-Advanced and is also actively working on research and standardization for 5G. He was a Vice Chairman of TSG RAN WG1 during February 2003 through August 2009, chaired LTE/LTE-Advanced MIMO sessions, and served as the Rapporteur for the 3GPP LTE-Advanced Rel-11 CoMP work item.

Invited Talk 3: "New Technologies for Next Generation Mobile Devices"

Dr. Te-Won Lee, IEEE Fellow, President, Qualcomm

Abstract:

This talk will present current state-of-the-art technologies in smart phones and how key mobile trends influence the mobile communication industry. Those trends include a strong push in wireless innovation, a new computing paradigm and the emergence of the era of the digital sixth sense. Qualcomm is innovating in all technology vectors that contribute to the next generation smart phone devices. This talk will present key technologies developed in corporate R&D and also research undertaken in the Korea R&D Center focusing on new mobile multimedia solutions including audio, vision and machine learning technologies. Furthermore, this talk will touch upon new market opportunities such as automotive, healthcare and wearables.

Biography:

Dr. Te-Won Lee (IEEE Fellow) is President of Qualcomm Korea and Head of the Qualcomm Korea Research Center where he oversees the research and development in multimedia technologies for mobile devices. Prior to Qualcomm, Dr. Lee was Chief Executive Officer (CEO) and co-Founder of SoftMax, Inc., a start-up company in San Diego which was acquired by Qualcomm. Dr. Lee was a professor at the Institute for Neural Computation at the University of California, San Diego (1999 - 2007), a research associate at the Salk Institute for Biological Studies (1997-1999) and a Max-Planck Institute fellow (1995-1997). He received his M.S. degree in 1995 and his Ph.D. degree in 1997 with Summa Cum Laude in Electrical Engineering from the University of Technology Berlin.

Industrial Sessions

October 29 (Thursday), 2015

Crystal Ballroom, 4th fl., 13:10-15:10

Industrial Session 2: Spectrum, Systems, and Technologies for the 5G Era

Chair: Dr. Jang-Won Lee, Professor, Yonsei University

Session	Title	Invited Speakers
13:10-15:10	The Virtuous Cycles of Spectrum, Economy, Engineering, and Theory toward the 5G Era	Dr. Byung K. Yi Executive Vice President, CTO InterDigital
	Huawei 5G Vision and Progress	Dr. Tsuyoshi Kashima CTO, Mobile Network Huawei Technologies Japan
	5G Mobile Communication System and Enabling Technologies	Dr. Byoung-Hoon Kim Vice President LG Electronics

Invited Talk 4: "The Virtuous Cycles of Spectrum, Economy, Engineering, and Theory toward the 5G Era"

Dr. Byung K. Yi, Executive Vice President, CTO, InterDigital

Abstract:

The 4th Generation wireless communication systems, such as LTE and Wi-Max, have been successfully combining the traditional mobile applications mainly serving circuit switched voice services with the IP-based internet-type of packet data services. Currently, mobile users can enjoy not only voice calls, but also video conferencing, instant messaging, broadcasting, multi-media services, and location-based services. However, demand for wireless broadband is outpacing the foreseeable availability of new spectrum. While FCC have outlined the a path for almost doubling the available spectrum for fixed and wireless broadband uses, some industrial experts forecasted a need for a thousand-fold increase in wireless capacity by 2020. To meet this demand, next generation 5G wireless systems should explore not only to increase the spectral efficiency bits/sec/Hz through new theories but also exploring the ways to operating the system with much intelligent ways. This presentation will go over the fundamental approaches of "Dynamic Spectrum Sharing", "Interference Alignment", "Location Based Intelligent Network Operations (LoBINO)", and "Dense Network" trying to link the theory, the economy, Engineering, and the spectrum.

Biography:

Dr. Byung K. Yi is InterDigital's Executive Vice President, InterDigital Labs, and Chief Technology Officer (CTO). As Head of InterDigital Labs, Dr. Yi is responsible for directing the development of advanced wireless and network technologies, the evolution of standards-based technologies and the company's participation in wireless standards bodies. Dr. Yi joined InterDigital in April 2014 from the Federal Communications Commission (FCC), where he had served as assistant division chief of engineering since 2012. Prior to his appointment at the FCC, Dr. Yi was at LG Electronics from 2000 to 2012, where as Senior Executive Vice President he headed the company's North American R&D center. A former member of InterDigital's Technology Advisory Council, Dr. Yi contributes more than 30 years of advanced wireless development experience. Dr. Yi also contributes a strong history of industry leadership. He has served on the board of directors or steering committees of a number of professional organizations, including the Telecommunication Industry Association, the Center for Wireless Communications, the 3rd Generation Partnership Project 2 Technical Specification Group, and a number of others. He was awarded the prestigious CDG (CDMA Development Group) Industry Leadership award, has been recognized by the National Engineer Week (NEW) Foundation, and inducted to the Hall of Fame by the School of Engineering and Applied Science of George Washington University. Dr. Yi received his Bachelor's degree in Electrical Engineering from Yonsei University (Korea), his Master's degree in Electrical Engineering from the University of Michigan, and his doctoral degree in Electrical Engineering from George Washington University.

Industrial Sessions

Invited Talk 5: "Huawei 5G Vision and Progress"

Dr. Tsuyoshi Kashima, CTO, Mobile Network, Huawei Technologies Japan

Abstract:

With the quick devolvement of mobile internet and Internet of Things (IoT), mobile broadband will permeate all areas of the society and the users expect a better blueprint for a networked world. 5G will have fundamental impact on the ICT industrial transformation and human life. As to be a key enabler of the future digital world, 5G is to be an ultimate platform for a connected world to enable new ways of innovation and collaboration and to create new opportunities. In this talk, we will share Huawei's vision and views on 5G, present Huawei 5G research progress, and introduce Huawei 5G progress with industry.

Biography:

Dr. Tsuyoshi Kashima is the CTO of mobile network in Huawei Japan. He received the B.S. and M.S. degrees in theoretical physics from Tokyo University. After joining Nokia Research Center, Tokyo in 2000, he was engaged in system level research on 3G, and also engaged in PHY and MAC research and standardization on 4G. He received his Ph.D. degree from Tokyo Institute of Technology in 2007 in the area of the MAP receiver architecture utilizing iterative joint processing utilizing message passing algorithm. Since 2008 November, he joined Huawei, and works in the Marketing and Solution Sales Department, and since 2015, he has been working in the current position.

Invited Talk 6: "5G Mobile Communication System and Enabling Technologies"

Dr. Byoung-Hoon Kim, Research Fellow, Vice President, LG Electronics

Abstract:

4G LTE/LTE-Advanced communication system has been successfully providing mobile broadband internet and multimedia services during the last several years. Although the LTE/LTE-Advanced system is expected to prevail in the market for far more years, wireless communication industries have already started to discuss developing and standardizing a 5G mobile communication system. Main drivers of the 5G system are rapidly growing mobile traffic, immersive multimedia services, mission critical IoT applications, and massive device connectivity. In this talk, we first introduce the differentiation point of the 5G system in terms of services, terminals, and networks and then discuss the potential of new radio technology candidates such as massive MIMO, mmWave, low latency radio, flexible/full duplex radio, V2X, new waveforms, and the others. Finally, we investigate the expected standard and deployment milestones and the 4G-to-5G transition strategies, including the roles of 4G evolution technologies and new radio technologies in the 5G system.

Biography:

Dr. Byoung-Hoon Kim received the B.S. and M.E. degrees in Electronics Engineering, and the Ph.D. degree in Electrical Engineering and Computer Science, from Seoul National University, Seoul, Korea, in 1994, 1996, and 2000, respectively. From 2000 to 2003, he was with GCT Semiconductor, Seoul, Korea, developing W-CDMA and WLAN chip sets. From 2003 to 2008, he was with QUALCOMM, Incorporated, San Diego, CA, where he was responsible for MIMO technology development and 3GPP LTE standard and design works. Since March 2008, he has been with LG Electronics as Vice President and Research Fellow, developing advanced wireless technologies including 5G mobile communications and 3GPP standard for future wireless systems. He was also involved in IEEE 802.11ac/af/ah standard works and was a member of board of directors of Wi-Fi Alliance during 2011-2012. Dr. Kim is co-author of Scrambling Techniques for CDMA Communications (Springer, 2001) and was elected as the 1st IEEE Communications Society Asia-Pacific Best Young Researcher in 2001.

Special Sessions

October 28 (Wednesday), 2015

Special Session I: Internet of Things (IoT) Platforms

Crystal Ballroom 3, 4th fl., 08:20-10:00

Chair: Dr. JaeSeung Song, Professor, Sejong University

Session	Title	Invited Speakers
08:20-10:00	Open Source oneM2M Platforms	Mr. Jaeho Kim Director KETI
	Internet of Things (IoT) and Open Interconnect Consortium	Mr. Jooyeol Lee Director Samsung Electronics
	IoT Enabler, from the Things to the Services and Service Platform	Dr. Byung K. Lim Vice President InterDigital Asia

Invited Talk 1: "Open Source oneM2M Platforms"

Mr. Jaeho Kim, Director, KETI

Abstract:

The Internet of Things (IoT) is gaining ground in various vertical domains such as healthcare, home automation and public services. Since IoT connects all smart objects and enables them to communicate with each other, the intelligent services introduced by IoT will provide a huge impact on our everyday life. However, this requires a common and open platform satisfying all different needs from various stakeholders and verticals. In order for such a common service platform to be useful, an international standard is required to support interoperability. This talk, therefore, will provide the effort of oneM2M standardization activities for IoT/M2M common service platforms. Finally, this talk will introduce an open source IoT service platform, which is called Mobius, implementing oneM2M standards and establishing a global IoT ecosystem with the global use of IoT/M2M devices and software.

Biography:

Mr. Jaeho Kim is a managerial researcher in Embedded Software Convergence Research Center at the Korea Electronics Technology Institute (KETI), South Korea from 2000. He is directing the research team for IoT and M2M Platform in KETI. His expertise covers wireless sensor networks, medium access protocols, and Internet of Things platforms. He is now serving as Chair of IoT Convergence Service Project Group of Telecommunications Technology Association (TTA) and Chair of Device Working Group of Korea IoT Association. He received the BS and MS degrees in Computer Science and Engineering from the Hankuk University of Foreign Studies, South Korea, in 1996 and 2000, respectively. Currently, he is a Ph.D. candidate in the Electrical and Electronic Engineering from the Yonsei University, South Korea. His research interests are in the areas of wireless sensor networks, medium access protocols, and Internet of Things.

Invited Talk 2: "Internet of Things (IoT) and Open Interconnect Consortium"

Mr. Jooyeol Lee, Director, Samsung Electronics

Abstract:

The Internet of Things (IoT) has been introduced in many areas but is subject to various definitions and interpretations among vendors, academia and governments. In most cases, IoT consists of sensors/actuators,

networks, cloud/intelligence, etc. From a standards viewpoint, one of the key areas in IoT is communication interoperability among things to enable discovery, message exchanges and use of vertical resources. In this presentation, to provide interoperability for IoT, key design principles such as a way of defining things, supported type of things, level of interoperability and technology accessibility will be presented. The Open Interconnect Consortium (OIC) is a comparatively new organization which adopts these kinds of design principles to support the IoT concept and is designed to provide interoperable technology to the IoT industry as a whole. The current progress of OIC as well as the upcoming certification program will also be presented.

Biography:

Mr. Jooyeol Lee is a distinguished standards expert as well as a leading innovative service layer standardization leader in Samsung Electronics. He has actively contributed and held leading roles in several service level standard bodies for more than 12 years such as Digital Living Network Alliance, Universal Plug and Play, Wi-Fi Alliance, Mobile Printing Alliance, and Car Connectivity. During the period, he chaired several working groups and made strategic decisions as a Board Director. He also led and coordinated among peer companies to form new alliances which required exact market analysis and technical differentiation. He is now leading the Open Interconnect Consortium Standard Working Group (WG) as Chair. The Standard WG is unique as it creates the strategy of a standards ecosystem and leverages market driven technologies. With strong leadership, the first set of specifications has been completed within a very short timeframe to meet market needs, including a certification program. The focus of this group is to try to understand ecosystem requirements and pick the right technologies to achieve better interoperability for IoT devices. He is currently a Director of Samsung Electronics and leads IoT standards strategy and technology development. His current interests include heterogeneous connectivity, platforms and resource modeling for multiple business verticals such as home, healthcare and industrial internet.

Invited Talk 3: "IoT Enabler, from the Things to the Services and Service Platform"

Dr. Bekay (Byung Keun) Lim, Vice President, InterDigital Asia

Abstract:

Internet of things (IoT) has been known as one of the inevitable business solutions of the next generation communication services. And we know that there are a lot of technologies, standards, and products providing the IoT services from the chips to servers, from personal scale services to enterprise scale services regardless of the past story. On the other hand, many of the key experts in the market players are skeptical about the IoT business, since there are no concrete and visible solutions making money and backup of the investment of the IoT business yet. Similarly, we are continuously being concerned about the future of the IoT business even though we believe that the IoT will be the key services of the next generation communication networks. Considering the concerns, this talk investigates and analyzes the barriers and enablers of the IoT business in terms of the services, regulations and products through the ecosystems of the IoT business. This talk also introduces how to define and analyze the possibility of success of the IoT services among a myriad of services. Lastly, we suggest several key enablers making the IoT business become the money making business against current technologies, regulations, and market situations.

Biography:

Dr. Byung Keun Lim is InterDigital's Vice President, InterDigital Asia Labs. As Head of InterDigital Asia LLC, Dr. Lim is responsible for directing the development of advanced wireless and network technologies, the evolution of standards-based technologies and the company's participation in wireless standards bodies as well as office operations in Asia Labs. He joined InterDigital Asia in January 2015 from the Airtech Systems in Korea, where he had served as Chief Technology Officer (CTO) of Engineering since 2013. Prior to his appointment at the Airtech Systems, he had served as Chief Operational Officer (COO) in a start-up venture company for the smartphone's touch & display panel component. He also had worked for ArrayComm Korea LLC as the President of the Korea office from 2005 to 2009. Prior to his appointment at the

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ArrayComm Korea, Dr. Lim was with LG Electronics from 1995 to 2005 as a Principal Engineer and Chief Manger of the system R&D division. He has a strong history of industry leadership. He has contributed to commercialize the IS-95 standard based CDMA cellular systems as the world's first commercial product in 1996, and also commercialized the cellular data services based on IS-657 based asynchronous data and G3 Fax services as the world's first commercial product in 1998. He had led to make a standard and PDSN and GGSN products for the packet data systems of the 1xEV-DO, and WCDMA in 2001. He also had served as a delegate of professional organizations including the Telecommunication Technology Association in Korea, the Next Generation Network Promotion Group, and 3rd Generation Partnership Project 2 Technical Specification Group, and a number of others. He was awarded the prestigious IR52 ChangYoungSil award in 1998 for the world's first CDMA cellular data services system commercialization. Dr. Lim received his Bachelor's degree in Electronics Engineering from Hanyang University, Seoul, Korea, in 1984, and his Master's degree and Doctoral degree in Electrical & Electronics Engineering from KAIST, Korea, in 1986 and 1991, respectively.

October 28 (Wednesday), 2015

Special Session II: Internet of Things (IoT) Connectivity

Crystal Ballroom 3, 4th fl., 16:00-17:40

Chair: Dr. JaeSeung Song, Professor, Sejong University

Session	Title	Invited Speakers
16:00-17:40	Participatory Sensing – from Algorithms to Practices	Dr. Harold Liu Professor Beijing Institute of Technology
	Internet of Things (IoT) Connectivity Standards	Dr. Han Gyu Cho Director LG Electronics
	Optical Camera Communication based D2D Services	Dr. Yu Zeng Research Manager Beijing Research Institute, China Telecom

Invited Talk 4: "Participatory Sensing – from Algorithms to Practices"

Dr. Harold Liu, Professor, Beijing Institute of Technology

Abstract:

Smart devices including smart phones, smart pads, and tablets are used not only as a means of communication mobile devices of choice, but also as powerful sensing units with a rich set of embedded sensors such as accelerometer, digital compass, gyroscope, GPS, microphone, camera, etc. Collectively, these sensors are enabling a new type of applications that can recruit ordinary citizens to collect and share sensory data, and ultimately give rise to a new area of research, called "participatory sensing". By using these embedded sensors, the ordinary citizens act as "participants" to sense multi-dimensional data streams from the surrounding environment and share these streams using existing communication infrastructure. Participatory sensing has shown its great potential in retrieving context-aware information across a wide variety of application domains, such as healthcare, social networks, safety, environmental monitoring and transportation, for academia, industry and government agencies. This talk will introduce not only the fundamental concept of participatory sensing, but also its algorithms, protocols, systems, and applications, to ensure to recruit an optimal set of participants to perform the sensing tasks.

Biography:

Dr. Harold Liu received his Ph.D. degree in Electronic Engineering from Imperial College, UK in 2010, and B.Eng. degree in Electronic and Information Engineering from Tsinghua University, China in 2006. He is currently a Full

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Professor at the School of Software, Beijing Institute of Technology, China. He also serves as the Head of Department of Software Service Engineering, Director of IBM Mainframe Excellence Center (Beijing), Director of IBM Big Data and Analysis Technology Center, and Director of National Laboratory of Data Intelligence for China Light Industry. Before moving to academia, Prof. Liu worked for IBM Research - China as a staff researcher and project manager from 2010 to 2013, as a postdoctoral researcher at Deutsche Telekom Laboratories, Berlin, Germany in 2010, and as a visiting scholar at IBM T. J. Watson Research Center, USA in 2009. His current research interests include the Internet-of-Things (IoT), Big Data analytics, mobile computing, and wireless ad hoc, sensor, and mesh networks. Prof. Liu was elected into the "High-level Overseas Talents Return Home Program" pool, approved by the Ministry of Human Resource and Social Security (MHRSS), China in 2015. He also received the Distinguished Young Scholar Award in 2013, IBM First Plateau Invention Achievement Award in 2012, and IBM First Patent Application Award in 2011 and was interviewed by EEWeb.com as the Featured Engineer in 2011. Prof. Liu has published more than 60 prestigious conference and journal papers and owned more than 10 EU/U.S./China patents. He served as the editor for KSII Trans. on Internet and Information Systems and the book editor for seven books published by Taylor & Francis Group, USA. He also has served as the General Chair of IEEE SECON'13 workshop on IoT Networking and Control, IEEE WCNC'12 workshop on IoT Enabling Technologies, and ACM UbiComp'11 Workshop on Networking and Object Memories for IoT. He served as the international consultant to Asian Development Bank, Bain & Company, and KPMG, USA, and the peer reviewer for Qatar National Research Foundation, and National Science Foundation, China.

Invited Talk 5: "Internet of Things (IoT) Connectivity Standards"

Dr. Han Gyu Cho, Director, LG Electronics

Abstract:

The interest in Internet of Things (IoT) has been drastically increasing due to the pervasiveness of wired and wireless communications and the demand on new services. IoT consists of many functional blocks from sensors and connectivity technologies such as Wi-Fi, Bluetooth, ZigBee, and etc. to the various services which eventually provide new values to the clients. This talk briefly provides the overview of IoT and details on the IoT connectivity standards which are mainly considered in the market.

Biography:

Dr. HanGyu Cho received his B.S., M.S., and Ph.D. degrees in Electrical and Electronic Engineering from Yonsei University, Seoul, Korea, in 1999, 2001, and 2005, respectively. For two years from September 2005, he was with the Wireless Networking and Communications Group (WNCG), The University of Texas at Austin as a post-doctoral research associate. In 2007, he joined LG Electronics and has worked for Standardization of 4G technologies, e.g., WiMAX and LTE/LTE-A. From 2012, he has been working on Wi-Fi standardization and also researching on IoT connectivity.

Invited Talk 6: "Optical Camera Communication based D2D Services"

Dr. Yu Zeng, Research Manager, Beijing Research Institute, China Telecom

Abstract:

China Telecom operates the world's largest fixed network, CDMA2000 mobile network and broadband networks, gained strong technical strength on mobile communications, network gateways, and IPv6 technologies. China Telecom started the visible light communication (VLC) research in 2013, and actively participated in industry, domestic and international standard organizations including the IEEE 802.15.7. China Telecom is one of the first operators to get involved in VLC standards, continue to contribute to VLC-related IEEE 802 standards and promote viable VLC techniques. For mobile devices, projects "e-trans" and "dynamic QR code" paved the way for possible VLC applications. Demonstrations were developed using different screen coding. The link can achieve transfer data rate up to 80Mb/s. This will provide possible solutions for VLC systems. For industrial

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applications, large shopping malls, banks and stations can take advantages of LED lighting bulbs, and be treated as small "hot spots", deliver capabilities such as advertising and promotion vouchers, membership information, store APP client and even indoor navigation. VLC can also bring more possibilities to public transport service companies. VLC systems are economical, convenient, interference free and can be easily applied within the constrained space. For the tourism industry, using VLC technology enables better information delivery when other connection methods are limited, and can also provide statistical analysis through mobile applications. The VLC technology is one of the future trends for short range communications. The industry can take advantages from the knowledge and experience provided by telecom operators. With contributions from all sectors of the industry chain, the key VLC technologies can be further developed and validated.

Biography:

Dr. Yu Zeng received his BSc degree in Physics from Beijing Jiaotong University in 2001, MSc and PhD degrees in Optical Wireless Communication from the University of Warwick, UK in 2003 and 2008, respectively. He joined China Telecom in 2011. His area of interests include optical wireless communication, cloud computing and Internet of Things. He leads the Visible Light Communication (VLC) research team in China Telecom. He developed solutions for providing data transmission between mobile devices and indoor navigation employing VLC. He is a recipient of the 2015 Innovation Grant from China Telecom. Dr. Yu Zeng served as the Vice Chair of IEEE 802.15.7r1 standard committee (focusing on optical camera communication and LiFi), a Chartered Engineer, and a senior consultant for national high technology research and development program (863 project).

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Special Session III: 5G Requirements and Enabling Technologies

Crystal Ballroom 3, 4th fl., 09:00-10:40

Chair: Dr. Young-June Choi, Professor, Ajou University

Session	Title	Invited Speakers
09:00-10:40	Spectrum Management based on Spectrum Database for the 5G and beyond Wireless World	Dr. Takeo Fujii Professor Advanced Wireless and Comm. Research Center University of Electro-Communications, Japan
	5G Enabling Technologies for Enhanced Mobile Broadband, Low Latency and High Reliability, and Massive IoT	Mr. Chulsik Yoon Managing Director ETRI
	Nokia 5G Radio Aspects and Architecture	Dr. Brian Cho Head of Technology for APAC & Japan Nokia

Invited Talk 7: "Spectrum Management based on Spectrum Database for the 5G and beyond Wireless World"

Dr. Takeo Fujii, Professor, Advanced Wireless and Communication Research Center, The University of Electro-Communications, Japan

Abstract:

The spectrum management is a key issue for sustainable growth of future wireless communication systems. Due to the rapidly increasing number of wireless devices, not only smart phones but also terminals for IoT, the scarcity of the spectrum suitable for mobile communications becomes a serious problem in the 5G and beyond wireless world. Currently, each spectrum band is allocated to an individual system without any spectrum sharing in the

same area except for the very limited spectrum, e.g., the spectrum for the wireless LAN. However, this kind of monopolized spectrum allocation policy degrades the spectrum efficiency because lots of unused spectrum remained in the temporal domain and the spatial domain. In future wireless communication systems, we need to consider dynamic sharing of the spectrum among multiple systems for realizing the highly efficient spectrum utilization. In 5G mobile communications, it is required to consider spectrum sharing such as authorized shared access (ASA), unsilenced LTE (U-LTE), TV white space, and public safety. Moreover, dynamic autonomous spectrum management shifted from the fixed spectrum allocation is an important issue for creating a new wireless world. In this presentation, to effectively manage the limited resource of spectrum, we show the concept of hierarchical spectrum database where a hierarchical structure is considered. A lower layer database collects information about the local radio and network environment like measured received power, connectivity of terminals, type of data packets and so on by user terminals, and the information is statistically stored. By using the information, the spectrum and network environment can be known. This kind of information is transferred and summarized at the higher layer and dynamical spectrum management considering the demands of users and also spectrum efficiency can be achieved. Therefore, more flexible and dynamic spectrum allocation can be realized. At the highest layer, a global spectrum allocation policy can be defined for deciding the basic spectrum utilization policy managed by regulators. A spectrum management of the hierarchical spectrum database is based on big data of radio and network environment collected by a huge amount of user terminals. The spectrum database can help the channel management of not only the current spectrum shared bands like 2.4GHz and 5GHz but also the new spectrum shared bands based on ASA and other future spectrum sharing system with new technologies.

Biography:

Prof. Takeo Fujii received the B.E., M.E. and Ph.D. degrees in Electrical Engineering from Keio University, Yokohama, Japan, in 1997, 1999 and 2002 respectively. From 2000 to 2002, he was a research associate in the Department of Information and Computer Science, Keio University. From 2002 to 2006, he was an assistant professor in the Department of Electrical and Electronic Engineering, Tokyo University of Agriculture and Technology. From 2006 to 2014, he has been an associate professor in Advanced Wireless Communication Research Center, The University of Electro-Communications, Japan. Currently, he is a full professor in Advanced Wireless and Communication Research Center, The University of Electro-Communications. His current research interests are in the areas of cognitive radio and ad-hoc wireless networks. He received Best Paper Award in IEEE VTC 1999-Fall, 2001 Active Research Award in Radio Communication Systems from IEICE technical committee of RCS, 2001 Ericsson Young Scientist Award, Young Researcher's Award from the IEICE in 2004, The Young Researcher Study Encouragement Award from IEICE technical committee of AN in 2009, and Best Paper Award in IEEE CCNC 2013. He is a member of IEEE and IEICE.

Invited Talk 8: "5G Enabling Technologies for Enhanced Mobile Broadband, Low Latency and High Reliability, and Massive IoT"

Mr. Chulsik Yoon, Managing Director, ETRI

Abstract:

5G is the next generation of mobile communications realizing the vision of ubiquitous connectivity for any kind of devices and any kind of applications. In the 2020s when the commercial 5G services will be launched, new paradigms will emerge. The existing infra-centric wireless world will be replaced by the user-centric world. Users and things will be connected through a wireless network at anytime and anywhere in a flexible and affordable way. They will also have the context-aware intelligence so that the users can experience a various kinds of novel services. This talk will introduce 5G enabling technologies in terms of three categories, i.e., enhanced mobile broadband, low latency and high reliability, and massive IoT. This talk will also briefly discuss the opportunities and challenges of these enabling technologies.

Biography:

Mr. Chulsik YOON is serving as Managing Director of Wireless Transmission Research Department, ETRI. The Wireless Transmission Research Department has the responsibility for performing technology-leading R&D for the 5G mobile communications, which is divided into the standard-leading R&D and the fundamental-technology-leading R&D.

First part focuses on current standard items such as massive-MIMO antenna technologies and LTE-based licensed-assisted access (LAA) technologies. Second part deals with the fundamental and futuristic research topics related with the above 5G goals such as low latency and ultra-high reliability RAN, In-band Full Duplex (IFD), Ultra Dense Networks (UDN), Moving Networks (MN), and Massive Connectivity Communications. He has more than 20 years of experience on mobile communication standardization and advanced researches since he joined ETRI in 1993. He received a Master's degree in Physics from Pohang University of Science and Technology (POSTECH), KOREA. He has more than 100 issued patents.

Invited Talk 9: "Nokia 5G Radio Aspects and Architecture"

Dr. Brian Cho, Head of Technology for APAC & Japan, Nokia

Abstract:

The fourth generation mobile communications (4G) such as LTE is well accepted by many markets, and this fast market adoption on LTE drives the industry to the next level of innovation towards the fifth generation mobile communications (5G). It is believed that 5G will not only enhance 'mobile broadband' but also enhance or enable 'massive machine type communications' and 'ultra reliable and low latency communications'. The diverse use cases lead to diverse requirements ranging from peak data rate and spectrum efficiency to latency and connection density. Therefore, 5G will require flexible architecture. In this talk, Nokia 5G radio aspect will be firstly explained such as physical layer design fundamental, frame structure, and numerology. Then, Nokia's view on 5G architecture will be explained. With the flexible 5G architecture, various benefits can be realized such as scalability, network as a service, session on demand, mobility on demand, and reliability.

Biography:

Dr. Brian Cho is currently working for Nokia in its Networks business as Head of Technology for APAC and Japan. He is also serving as Head of Advanced Technology Center (ATC) Korea. In this role, he is responsible for all advanced technology discussions and collaboration between Nokia, customers, and industry. Before joining Nokia in 2010, he was firstly with R&D center at KTF (a wireless operator in Korea) during 1999-2001, mainly working on the physical layer topics of IS-95 A/B and 3GPP WCDMA. In 2001, he joined wireless communications modem development team at GCT Semiconductor, developing various kinds of wireless communications modem including 3GPP Release 99 WCDMA PHY/MAC modem, Bluetooth, IEEE 802.11a/b/g Wireless LAN, DMB (Digital Multimedia Broadcasting), etc. In 2005, he joined Intel Corporation, and handled various technical topics around mobile broadband technologies ranging from standardization and regulatory/policy to products and network engineering in APAC region during 2005-2010. He holds the B.S. degree and the M.S. degree of Electrical Engineering, both from Seoul National University, Korea, and holds the Ph.D. degree of Electrical Engineering from Kwangwoon University, Korea. He also holds the B.S. degree of Business Administration from Korea National Open University. He holds several US patents and Korean domestic patents on wireless communications. He also wrote a few books such as "3G/4G Mobile Communication Systems – Easily explained", and translated several books to Korean including a well-known book written by Harri Holma and Antti Toskala. His current research interests include LTE, further evolution of LTE, and future mobile communications such as 5G.

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Special Session IV: Smart Media for the 5G Era

Crystal Ballroom 3, 4th fl., 15:30-17:10

Chair: Dr. Seung-Hoon Hwang, Professor, Dongguk University

Session	Title	Invited Speakers
15:30-17:10	System Architectures, Mathematical Modeling, and Algorithms for Holographic Three-Dimensional Displays	Dr. Hwi Kim Professor Dept. of Electronics and Information Engineering, Korea University
	Holography-like High Density Multiview 3D Display for Realistic Visual Effect	Dr. Sung Kyu Kim Principal Research Scientist Korea Institute of Science and Technology
	Core Technologies and Challenges in Augmented Reality and Virtual Reality	Dr. Jong-Il Park Professor Dept. of Computer Science and Engineering, Hanyang University

Invited Talk 10: "System Architectures, Mathematical Modeling, and Algorithms for Holographic Three-Dimensional Displays"

Dr. Hwi Kim, Professor, Dept. of Electronics and Information Engineering, Korea University

Abstract:

Holographic three-dimensional (3D) display technology is considered as the ultimate form of realistic three-dimensional displays. However, the development status is at the very initial stage, so it is expected that the practical realization of high quality holographic 3D displays will not be seen in the near future. There are still several fundamental issues in almost all aspects of holographic 3D displays, which have to be resolved with a ground-breaking research. In this presentation, the system architectures that have been researched in our country are reviewed, and a research on mathematical modeling and simulation techniques for those holographic 3D displays is introduced. The holographic content generation is a key technology in this field. Broadly speaking, holographic 3D display is considered as one of computational displays because the content generation is carried out by non-intuitive complicated numerical algorithms. The design concepts of computational algorithms and concrete case studies of computer-generated holograms (CGHs) are presented. A fundamental study on the wave optic understanding of human eyes and perception of three-dimensional scene and theoretical analysis on the information capacity of holograms in terms of space-bandwidth-product (SBP) are also discussed. In order to display CGHs contents with the real light field, we have developed several holographic display architectures. Underlying design concepts, characteristic features, and limitations of several system architectures are briefly introduced. Perspectives on system architecture and algorithms of CGHs will also be addressed.

Biography:

Prof. Hwi Kim received the B.E., M.E. and Ph.D. degrees in Electrical Engineering from Seoul National University, Korea, in 2001, 2003 and 2007 respectively. From 2010 to 2014, he was an assistant professor in the Department of Electronics and Information Engineering, Korea University. From 2014 to present, he is an associate professor in the same department. His current research interests are in holography and nanophotonics. In particular, he has a specialty in mathematical modeling and numerical algorithms in wide areas of optics and photonics.

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Invited Talk 11: "Holography-like High Density Multiview 3D Display for Realistic Visual Effect"

Dr. Sung Kyu Kim, Principal Research Scientist, Imaging Media Center, Korea Institute of Science and Technology

Abstract:

Autostereoscopic 3D display technology which removes the need for special eye glasses for 3D image and multiview 3D is being developed for commercialization nowadays. Integral Photography (IP) and Super Multi-View (SMV) will be the next generation of multiview type 3D display, and holographic 3D display is considered as the final goal technology of 3D display. There have been many attempts for the mass product commercialization of multiview 3D technology. Parallax barrier and lenticular types are the usual approaches, while the light field 3D technology has emerged as a new kind of multiview 3D display. Multiview 3D display has several problems that hinder popular utilization such as low quality and high crosstalk of 3D image, narrow viewing area caused by the limited number of viewpoints, low resolution of each viewpoint image, and eye fatigue phenomenon. Some of these problems can be solved by using real-time face or eye tracking technology, when 3D display for a single viewer is considered. However multi-user viewing and eye fatigue are still important problems. SMV 3D technology is developed to overcome those problems and High Density Multiview (HDM) 3D technology resembles characteristics of the light field and SMV types. In this talk, we introduce recent developments in HDM 3D displays.

Biography:

Dr. Sung-Kyu Kim received his Ph.D. degree from the Quantum Optics Group of Physics, Korea University, in 2000. He spent two years as an invited research scientist at the 3D TV Group of Telecommunications Advancement Organization in Japan. In 2001 he joined Korea Institute of Science and Technology, where he is currently a principal research scientist. His research interests include optical design of autostereoscopic 3-D display systems, multi-view image processing, digital holography, holographic optical elements, and multi-focus 3D display.

Invited Talk 12: "Core Technologies and Challenges in Augmented Reality and Virtual Reality"

Dr. Jong-Il Park, Professor, Dept. of Computer Science and Engineering, Hanyang University

Abstract:

Augmented Reality (AR) and Virtual Reality (VR) are emerging fast as a practical way of enriching our everyday lives. AR is a live view of a real-world environment where some of the useful information is carefully augmented by a computer. In contrast, VR replaces the real world with a simulated world as if the user is immersed in the virtual world. In this talk, the concept of AR/VR is explained and recent trends are overviewed first. Then, the core technologies for realizing the AR/VR are introduced. Critical enabling technology of AR/VR has been camera tracking for long time. Owing to the rapid progress in computer vision technology, camera tracking is getting matured in many ordinary situations. Object recognition and tracking are also key technologies for intelligent services. Moreover, seamless compositing of real and virtual worlds is very important as presence and immersion are essential in AR/VR. Through this presentation, important technical issues in core technologies are illuminated. Finally, the future of our life is discussed in relation to AR/VR.

Biography:

Prof. Jong-Il Park received the B.S., M.S., and Ph.D. degrees in Electronics Engineering from Seoul National University, Korea, in 1987, 1989, and 1995, respectively. From 1996 to 1999, he worked for the ATR Media Integration and Communication Research Laboratories, Kyoto, Japan. In 1999, he joined Hanyang University, Seoul, Korea, where he is currently a professor at Department of Computer Science and Engineering. His research interests include computer vision/graphics, virtual and augmented reality, computational imaging and display, and human-computer interaction.

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October 30 (Friday), 2015

Special Session V: Mobile Systems

Crystal Ballroom 3, 4th fl., 08:30-10:10

Chair: Dr. Ye-Hoon Lee, Professor, Seoul National Univ. of Science & Technology

Session	Title	Invited Speakers
08:30-10:10	Joint Mobile Power Management for OS, Network, and Service	Dr. Young-June Choi Professor Dept. of Computer Engineering, Ajou University
	Cellular Terminal Modem Development Trends and Future Prospects	Dr. Chaehag Steve Yi Master (VP) Samsung Electronics
	Wi-Fi Offloading: Mobile CDN's Perspective	Dr. Yung Yi Professor Dept. of Electrical Engineering, KAIST

Invited Talk 13: "Joint Mobile Power Management for OS, Network, and Service"

Dr. Young-June Choi, Professor, Dept. of Computer Engineering, Ajou University

Abstract:

Mobile systems are very sensitive to the drainage of battery energy as the performance of mobile application processors is evolving dramatically. Due to the battery constraint, mobile systems deploy many solutions such as dynamic voltage and frequency scaling (DVFS) and multi-core technologies. Also, network connectivity drives mobile devices to waste much energy regardless of user activities. To resolve this, LTE networks use an energy efficiency solution such as connection management and discontinuous reception (DRX). In this talk, we discuss joint solutions that consider energy efficiency of three domains: OS, network, and service.

Biography:

Dr. Young-June Choi is an associate professor at Ajou University, Korea. He received his B.S., M.S., and Ph.D. degrees from the Department of Electrical Engineering and Computer Science, Seoul National University, Korea, in 2000, 2002, and 2006, respectively. From Sept. 2006 through July 2007, he was a postdoctoral researcher at the University of Michigan, Ann Arbor, MI, USA. From 2007 through 2009, he was with NEC Laboratories America, Princeton, NJ, USA, as a research staff member. He joined Ajou University from September 2009 as a faculty member and founded Mobile Platform, Service, and Network (Mobile PLANET) Lab. He is an adjunct professor at Seoul National University, Korea, from September 2015 and an honorary professor at Xiangtan University, China, from Dec. 2013. Prof. Choi's research areas include vehicular networking, device-to-device communication, dynamic spectrum access, IoT, video streaming, network security, and mobile power management. He has co-authored more than 200 international papers. He was OC member of IEEE SECON 2012, IEEE VTC Spring 2014, IEEE ICUFN 2013-2015, and ICTC 2014-2015. Prof. Choi has served as editor of JCN (Journal of Communications and Networks), ICT Express, and Elsevier Digital Communications and Networks and he is currently serving as guest editor of Springer PPNA (Peer-to-Peer Networking and Applications) and MIS (Mobile Information Systems). He is Director of Korean Institute of Communications and Information Sciences (KICS) since 2014, a member of TTA WG9013, and a senior member of IEEE. He was awarded a Gold prize at Samsung Humantech Thesis Contest in 2006.

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Invited Talk 14: "Cellular Terminal Modem Development Trends and Future Prospects"

Dr. Chaehag Steve Yi, Master (VP), Samsung Electronics

Abstract:

An easy and active sharing of information is a main success factor of a data-driven world, where all individuals have become active participants. In the data-driven world, mobile devices such as smart-phones, tablets, and wearables have become indispensable to users for their everyday life. Major enablers of this data-driven world are advances in cellular and connectivity technologies which support wireless capacity enough to accommodate data traffic surge. Cellular mobile communications systems have been evolving, is evolving, and will evolve continuously. All cellular systems have been unified into the LTE system which introduces new features without pause such as D2D (Device-to-Device), LAA (Licensed Assisted Access), and FD-MIMO (Full Dimension-MIMO). Therefore, in the development of cellular terminal modem chipsets, one of the most important things is to implement new features on time and to respond to the market requirements. In other sides, to prepare mid/low end markets which become dominant markets, various types of integration of major components of smart-phone, such as application processor, baseband modem, RF device, power management, and wireless connectivity, have been attempted to make cost reduction. Furthermore, it becomes more important to provide hardware and software turn-key solutions.

Biography:

Dr. Chaehag Steve Yi received the B.S., M.E., and Ph.D. degrees in Electronics Engineering from Seoul National University, Seoul, Korea, in 1989, 1991, and 1996, respectively. He worked for the Electronics and Telecommunications Research Institute (ETRI), Taejon, Korea, on a part-time basis in 1992. He has worked for Samsung Electronics Co., Ltd. since 1993. He is currently a Master of Samsung Electronics and participates in the development and commercialization of cellular terminal modem chipsets. His research interests include digital communication theory, mobile communication systems, wireless connectivity, joint RF and baseband optimization, software-defined radio processor, and cellular modem architecture design.

Invited Talk 15: "Wi-Fi Offloading: Mobile CDN's Perspective"

Dr. Yung Yi, Professor. Dept. of Electrical Engineering, KAIST

Abstract:

This talk presents our recent research on Wi-Fi offloading. Wi-Fi offloading has been typically applied as a way of augmenting cellular networks' capacity, but our research proposes a new angle taken from the mobile CDN system's perspective. Exploiting people's diverse mobility and traffic diversity that often allows delay tolerant delivery, time can be used as an important resource of reliably and cheaply delivering mobile contents. We have built a Wi-Fi offloading based mobile CDN system as well as an example application, and this talk summarizes the major challenges in doing so and how we solve them. Through this system development, we also discuss how to build up a good mobile ecosystem where users, content providers, and mobile network operators are all happy in the future.

Biography:

Dr. Yung Yi received his B.S. and the M.S. in the School of Computer Science and Engineering from Seoul National University, South Korea in 1997 and 1999, respectively, and his Ph.D. in the Department of Electrical and Computer Engineering at the University of Texas at Austin, USA in 2006. From 2006 to 2008, he was a post-doctoral research associate in the Department of Electrical Engineering at Princeton University. Now, he is an associate professor at the Department of Electrical Engineering at KAIST, South Korea. His current research interests include the design and analysis of computer networking and wireless communication systems, economic aspects of communication networks (aka network economics), and social networks. He was the recipient of two best paper awards at IEEE SECON 2013 and ACM Mobihoc 2013. He is now an associate editor of IEEE/ACM Transactions on Networking and Journal of Communication Networks.

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Special Session VI: Software-Defined Networking (SDN) & Network Function Virtualization (NFV)

Crystal Ballroom 3, 4th fl., 11:10-12:50

Chair: Dr. Seong-Ho Jeong, Professor, Hankuk Unversity of Foreign Studies

Session	Title	Invited Speakers
11:10-12:50	Enabling Real-time Centralized Optimization for Global-Scale Video Delivery	Dr. Dongsu Han Professor Dept. of Electrical Engineering, KAIST
	Operator Issues Towards the Next Step for SDN/NFV	Dr. Eun Kyoung Paik Vice President KT
	Beyond Features and Performance: SDN/NFV Security and Robustness	Dr. Jaewoong Chung CEO Atto Research

Invited Talk 16: "Enabling Real-time Centralized Optimization for Global-Scale Video Delivery"

Dr. Dongsu Han, Professor, Dept. of Electrical Engineering, KAIST

Abstract:

Live video delivery is a rapidly growing business and its traffic is expected to reach a peak of 50 Tbps this year. Popularization of personal broadcasting and streaming mega-events are leading the trend. This surging popularity, however, can potentially challenge how Internet video delivery is done. Traditional video delivery networks (e.g., content delivery networks) are facing challenges because they must meet users' demands for fast join times, high bitrates, and low buffering ratios, while minimizing their own cost of delivery and responding to issues in real-time. Wide-area latency, loss, and failures, as well as varied workloads ("mega-events" to long-tail), make meeting these demands more challenging. A recent analysis of video sessions suggested that a centralized controller could improve user experience by controlling the resource globally. However, enabling the centralized control raises many design and implementation issues due to the difficulty of quickly handling failures, a requirement of both operators and users. In this talk, we explore how we might enable the centralized control over a globally distributed network with real-time requirements. Our key approach is to utilize both centralized and decentralized control, while minimizing negative interactions between the two. To provide a concrete example, we present VDN, a practical approach to a video delivery network that uses a centralized algorithm for live video optimization. VDN provides CDN operators with real-time, fine-grained control. Despite of challenges resulting from the wide-area (e.g., state inconsistency, partitions, failures), we show that using a hybrid control plane increases video quality and decreases the delivery cost. This work is a joint work between KAIST and Carnegie Mellon University.

Biography:

Dr. Dongsu Han is a professor at KAIST in the Department of Electrical Engineering and the Graduate School of Information Security. He received his Ph.D. degree from the Computer Science Department at Carnegie Mellon University in 2012. His research interests include Internet architectures, cloud and distributed systems, and Internet content delivery. As part of this thesis work, he worked on a new Internet architecture.

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Invited Talk 17: "Operator Issues Towards the Next Step for SDN/NFV"

Dr. Eun Kyoung Paik, Vice President, KT

Abstract:

SDN (Software-Defined Networking) and NFV (Network Function Virtualization) have been viewed as groundbreaking approaches towards a new paradigm of infrastructure that provides flexibility, service agility, and CAPEX/OPEX reduction. This talk illustrates the concept and realization of SDN and NFV focusing on operator perspective and issues. Firstly, it introduces the motivation and demands for SDN and NFV from the view of operators. Secondly, recent issues of standardization and open source development are discussed. Finally, deployment and evaluation issues are illustrated over classified areas.

Biography:

Dr. Eun Kyoung Paik is currently a Vice President in KT and leading the R&D in the areas of SDN, NFV, and Carrier Grade Cloud Infrastructure. She has been working on multimedia communications, mobility management, and SDN/NFV infra since she joined KT in 1992. She is leading SDN/NFV standardization in Korea as a Vice Chair of Future Internet Project Group affiliated with Telecommunications Technology Association (TTA), and serving for Open Standards and Internet Association (OSIA) as a Board Director.

Invited Talk 18: "Beyond Features and Performance: SDN/NFV Security and Robustness"

Dr. Jaewoong Chung, CEO, Atto Research

Abstract:

Software-defined network and network function virtualization have been changing the landscape of network industry. They promise to deliver lower CAPEX and OPEX, service automation for operators, and dynamic flow control for operational intelligence. There has been an industry-wide move for traditional network vendors, server manufacturers, and startups to promote this technological disruption. While their main focus has been performance and features, it is obvious that the SDN/NFV technologies need to be deployed in production environments in a secure and robust way. This talk discusses the possible security and robustness issues in the current SDN/NFV implementations. Then, it presents the solutions and techniques to address the issues and concludes with suggestions for potential future research topics with regard to the security and robustness of the SDN/NFV technologies.

Biography:

Dr. Jaewoong Chung is the CEO of Atto Research, specialized in software-defined network and network function virtualization. He is leading Atto Research's efforts to develop market-leading products based on SDN/NFV technologies. He worked on next-generation x86 architecture and heterogeneous computing as a senior scientist at Intel Labs from 2010 to 2012. He developed new x86 architecture for die stacking, AMD64 extension, and many-core processors for cloud computing at AMD from 2008 to 2010. He developed J2EE Web Application Server at Tmaxsoft from 2001 to 2004 and worked on a GPS-based auto navigation system at Samsung Electronics from 1999 to 2000. His research interest spans transactional memory, parallel programming, chip multi-processor. He received the Bachelor's degree and the M.S. degree from KAIST, and the Ph.D. degree in Electrical Engineering from Stanford University, USA.

Technical Paper Sessions

October 28 (Wednesday), 2015

[Session I-1] Advanced Wireless & Mobile Communication Systems and Infrastructure

Oct. 28, 08:20-10:00

Chair: Prof. Rong Ran (Ajou University, Korea)

I-1.1 **Multimode Precoded MIMO-based Qualitative Video Streaming using Frame Type Information**
Rong Ran (Ajou University, Korea); Junhui Zhao (Beijing Jiaotong University, P.R. China); Hayoung Oh (Soongsil University, Korea)

I-1.2 **Development of Wireless LAN Base Station with Web-QoE Based QoS Control**
Shiho Asano and Yoshihiro Ito (Nagoya Institute of Technology, Japan)

I-1.3 **Performance Analysis of Orbital Angular Momentum Signal Using Polarization Based Uniform Circular Array**
Daehee Park, Lakju Sung, Gye-Tae Gil and Dong-Ho Cho (Korea Advanced Institute of Science and Technology, Korea)

I-1.4 **Research A New Concise Criterion of the Channel Equalization System**
Huanjiong Zhang (Hangzhou Dianzi University, P.R. China)

I-1.5 **A Practical Precoder Design for EST-Based Modulation in Frequency-Selective Channel**
Sungmoon Jang (LIG NEX1, Korea); Hyunsung Park and Taewon Hwang (Yonsei University, Korea)

I-1.6 **Relationship between Direction of Arrival Estimation with MUSIC Algorithm and Number of Array Elements**
Prabesh Paudel, Joo-Seong Oh, Jong-sang Back, Min-A Jung and Seong Ro Lee (Mokpo National University, Korea)

[Session I-2] Smart Grid and Energy/Power-Aware Technologies & Applications

Oct. 28, 08:20-10:00

Chair: Dr. Hyunho Park (ETRI, Korea)

I-2.1 **Activation Pattern Based Standby Mode Scheduling for Power-Efficient Set-Top Box**
Hyunho Park, Eui-Suk Jung, Junghak Kim, Yong-Tae Lee and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

I-2.2 **A Novel Sensing Nodes Selection Scheme for Energy Efficiency of Cooperative Spectrum Sensing in Cluster-based CRSNs**
Fanhua Kong, Zilong Jin and Jinsung Cho (Kyung Hee University, Korea)

I-2.3 **A Context-Aware Method for Estimating Energy-Saving Efforts**
Moonok Choi and Il-Woo Lee (Electronics and Telecommunications Research Institute, Korea)

I-2.4 **On the Usages of the Battery in the Smart Grid: Reducing Cost and Enhancing Privacy**
Seokjae Moon, Hyun-Sik Jung and Jang-Won Lee (Yonsei University, Korea)

I-2.5 **Adaptive Interrupt Coalescing for Energy Efficiency and Performance**
Jae-Il Han, Young Man Kim and Jaeyoul Lee (Kookmin University, Korea)

Technical Paper Sessions

[Session I-3] u-Healthcare Systems and Bio-informatics & its applications

Oct. 28, 08:20-10:00

Chair: Prof. Yoshihiro Niitsu (Shibaura Institute of Technology, Japan)

I-3.1 Presumption Method of Psychological Pressure State Using Biological Sensors
Yasunori Hasegawa and Yoshihiro Niitsu (Shibaura Institute of Technology, Japan)

I-3.2 A Study on the Trend of real-time Medical Image wireless transmission technology
Ho-jong Chang and Hyunduk Kim (Korea Advanced Institute of Science and Technology, Korea)

I-3.3 The Expert System Application For Diagnosing Human Vitamin Deficiency Through Forward Chaining Method
Dony Novaliendry, Cheng-Hong Yang (National Kaohsiung University of Applied Sciences, Taiwan); Denno Guara Labukti A. Y. (State University of Padang, Indonesia)

I-3.4 Alarm System for Elder Patients Medication with IoT-Enabled Pill Bottle
Soo Yeon Sohn, Mungyu Bae, Dong Kyu 'Roy' Lee and Hwangnam Kim (Korea University, Korea)

[Session I-4] Systems, Services, and Applications for ICT Convergence

Oct. 28, 08:20-10:00

Chair: Prof. Hyun-Ho Choi (Hankyong National University, Korea)

I-4.1 DVB-RCS2 Emulation System: To Verify System Level Functions for Multiple Terminals
ManKyu Park and DeockGil Oh (Electronics and Telecommunications Research Institute, Korea)

I-4.2 Critical Message Scheduling for Disaster Response and Recovery Phases
Ponthai Klinsompus and Natawut Nupairoj (Chulalongkorn University, Thailand)

I-4.3 A Clean Cloud System Using Visual Platform For Moving Pictures
Young-Suk Yoon, Jongyoul Park and Kyoung Park (Electronics and Telecommunications Research Institute, Korea)

I-4.4 Towards Future Broadband Public Safety Systems: Current Issues and Future Directions
Andrijana Popovska Avramova, Sarah Ruepp and Lars Dittmann (Technical University of Denmark, Denmark)

I-4.5 Articulated Human Motion Tracking using a SOG-PF Algorithm
Jongsung Kim and Myunggyu Kim (Electronics and Telecommunications Research Institute, Korea)

I-4.6 Simultaneous Detection of Pedestrians, Pose, and the Camera Viewpoint from 3D Models
Sang Min Yoon and Jinjoo Song (Kookmin University, Korea); Gang-Joon Yoon (Ewha Womans University, Korea); Kwang-Soo Hahn (Kookmin University, Korea)

[Workshop I] Enabling Techniques for Future Mobile Communications (5G/6G) Part I

Oct. 28, 08:20-10:00

Chair: Dr. Suk Chan Kim (Pusan National University, Korea)

W-I.1 Content popularity-based caching Techniques for Wireless Content Delivery
Jun-Pyo Hong (Pukyong National University, Korea)

W-I.2 Beamforming Games with Quantized CSI in Two-user Interference Channels
Jung Hoon Lee (Jeju National University, Korea); Huaiyu Dai (North Carolina State University, USA)

W-I.3 Performance Analysis of Infrastructure WLANs with Multi-Packet Reception and Full-Duplex Radio
Ho Joon Yang, Heon Woong Park and Hu Jin (Hanyang University, Korea)

Technical Paper Sessions

W-I.4 **Site Specific Analysis on mm-Wave Radio Propagation in Commercial Small Urban**
YoungKeun Yoon, JongHo Kim, YoungJun Chong and Heon-Jin Hong (Electronics and Telecommunications Research Institute, Korea)

W-I.5 **A Fully Distributed Scheduling Algorithm for D2D Networks**
Moo-Woong Jeong and Tae-Won Ban (Gyeongsang National University, Korea)

W-I.6 **Filter Design of Interpolation-Based SC-FDMA Transmitter for Random Access Preamble Generation**
Seung Nam Choi, Il Gyu Kim (Electronics and Telecommunications Research Institute, Korea)

[Session P-1] Poster Session 1

Oct. 28, 08:20-10:00

Chair: Prof. Young-Sik Kim (Chosun University, Korea)

P-1.1 **Web-based Multi-view Video Replay Service System using Multi-PTZ Cameras**
Gi-Mun Um, Kwang-Yong Kim, Yookyung Kim and Kee Seong Cho (Electronics and Telecommunications Research Institute, Korea); Jeong-Hun Jang (Illisis, Inc, Korea); Dooyeol Yun and Kwangsue Chung (Kwangwoon University, Korea)

P-1.2 **A weighted trilateral filter for improving virtual view synthesis quality in MVD based 3D video system**
Dong-ryul Oh, Yongwoo Lee and Jitae Shin (Sungkyunkwan University, Korea)

P-1.3 **Tiled panoramic video transmission system based on MPEG-DASH**
Seong Yong Lim, Joo Myoung Seok and Jeongil Seo (Electronics and Telecommunications Research Institute, Korea); Tag Gon Kim (Korea Advanced Institute of Science and Technology, Korea)

P-1.4 **Downloadable Multi-CA/DRM service model and architecture for mobile broadcasting**
Han-Seung Koo (Electronics and Telecommunications Research Institute, Korea)

P-1.5 **Deformed 3D Model Identification using Combined Depth Image**
JeongSeok Jo and Jongweon Kim (Sangmyung University, Korea)

P-1.6 **Performance analysis of various co-existence methods with Wi-Fi in unlicensed bands**
Suna Choi (Electronics and Telecommunications Research Institute, Korea)

P-1.7 **Low Probability of Intercept Property of Binary Sidel'nikov Sequences**
Ji-Woong Jang (Ulsan College, Korea); Young-Sik Kim (Chosun University, Korea)

P-1.8 **Congestion Control Scheme for UHD Video Streaming over the Internet**
Sunghee Lee, Hyunwoo Lee, and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

P-1.9 **Implementing Multicast on ID/Locator Separation Network**
Joo-Chul Lee and Heeyoung Jung (Electronics and Telecommunications Research Institute, Korea)

P-1.10 **BER Enhancement of OFDM-Based Systems Using the Improved Parametric Linear Combination Pulse**
Cesar A. Azurdia-Meza (Universidad de Chile, Chile); Shaharyar Kamal, Kyesan Lee (Kyung Hee University, Korea)

P-1.11 **State-Driven Service Orchestration for Transparent Internet Caching**
Tae-Yeon Kim, Beum Chul Lee (Electronics and Telecommunications Research Institute, Korea)

P-1.12 **An Extended Web Browser for ID/Locator Separation Network**
Hae-Sook Jeon and Heeyoung Jung (Electronics and Telecommunications Research Institute, Korea); Woojik Chun (Hankuk University of Foreign Studies, Korea)

Technical Paper Sessions

P-1.13 Analysis on Visible Light Communication using Rolling Shutter CMOS Sensor
Trong-Hop Do and Myungsik Yoo (Soongsil University, Korea)

P-1.14 Compact 4 × 25 Gb/s Optical Receiver and Transceiver for 100G Ethernet Interface
Joon Ki Lee (Electronics and Telecommunications Research Institute, Korea); Youn-Seon Jang (Chungnam National University, Korea)

P-1.15 Design of Gesture Interface for Interactive Service
Sunghan Kim, Hongki Cha, Seungyun Lee (Electronics and Telecommunications Research Institute, Korea)

P-1.16 On Interleaver Design for BICM System with Low Error-Floors
Sangha Lee and Jeongseok Ha (Korea Advanced Institute of Science and Technology, Korea); Jaeyoon Lee (SK Hynix, Korea)

P-1.17 Dynamic RACH Preamble Allocation Scheme
Hyun-Yong Hwang, Sung-Min Oh, Changhee Lee, JaeHeung Kim and JaeSheung Shin (Electronics and Telecommunications Research Institute, Korea)

P-1.18 Route Pass Decision Methods for Route Adherence Monitoring in Maritime Domain
Yong-Kyun Kim and Byung-Gil Lee (Electronics and Telecommunications Research Institute, Korea)

P-1.19 Layer 2 Framing and Equivalent Error Rate over Airborne Common Data Link Systems
Jaesin Kim, Junghun Ryu, Young-Jae Ryu and Duck-Chan Han (Agency for Defense Development, Korea)

P-1.20 Packet Error Rate Measurement using IEEE 802.15.4-based Modem on the Korea High-Speed Train
Daegeun Park, SoonYong Song (Electronics and Telecommunications Research Institute, Korea); Wangrok Oh (Chungnam National University, Korea)

P-1.21 An inspection method for burrs in an inlet side hole using a low cost vision system
Hyeon Sung Cho and Su-young Chi (Electronics and Telecommunications Research Institute, Korea)

P-1.22 A Research on SDN-based Device-Assisted Network
Cheolhoon Kim and Sungwon Lee (Kyung Hee University, Korea)

P-1.23 A 3D object measurement method using single view camera
Mi-Seon Kang and Cheolhyo Lee (Electronics and Telecommunications Research Institute, Korea); Byoung-Moon You (L&Y Vision Technologies, Korea); Yun Su Chung (Electronics and Telecommunication Research Institute, Korea)

P-1.24 An Implementation of Energy-Saving Set-top Box
Junghak Kim, Eui-Suk Jung, Yong-Tae Lee and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

P-1.25 Mathematical Modeling for Calibrating Illuminated Image in Image Sensor Communication
Mohammad Arif Hossain, Chang Hyun Hong, Shareef Ifthekhar and Yeong Min Jang (Kookmin University, Korea)

P-1.26 A Cloud Transcoder using Download Cache Scheme
Eunjung Kwon, Shun-Shim Chun, Young-Tae Lee and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

P-1.27 Postal delivery area Management System
HongKyu Park, HyunSuk Kim, JungHee Jo, DaeSub Yoon (Electronics and Telecommunications Research Institute, Korea)

P-1.28 An SDN based Fully Distributed NAT Traversal Scheme for IoT Global Connectivity
Gijeong Kim, Junho Kim and Sungwon Lee (Kyung Hee University, Korea)

P-1.29 Verification for NFV-enabled Network Services

Myung-Ki Shin, YunChul Choi (Electronics and Telecommunications Research Institute, Korea); Hee Kwak (SOLiD, Korea); Sangheon Pack, Miyoung Kang, Jin-Young Choi (Korea University, Korea)

P-1.30 Screen Acceleration VNF scheme in NFV for VDI service

Jonghwan Kim, Kee Seong Cho and Won Ryu (Electronics and Telecommunications Research Institute, Korea); Dohyung Kim (Sungkyunkwan University, Korea)

P-1.31 Network Service Chaining Challenges for VNF Outsourcing in Network Function Virtualization

Hongseok Jeon and Beum Chul Lee (Electronics and Telecommunications Research Institute, Korea)

P-1.32 Interference Alignment based on Stacked Alamouti Code for 2×2 X Channels with Multiple Antennas

Dongyeong Song, Wonjae Shin and Jungwoo Lee (Seoul National University, Korea)

P-1.33 The structure for Distributed Virtual Resource Control to provide Agile Network Service in NFV

ShunShim Jean and KiSung Cho (Electronics and Telecommunications Research Institute, Korea)

P-1.34 Gaze Tracking System using Structure Sensor & Zoom Camera

HeeKyung Lee and Jeongil Seo (Electronics and Telecommunications Research Institute, Korea); Hoon Jo (Hanyang University, Korea)

P-1.35 A Study on Equal Energy Consumption in Smart Sensor Networks

In Hwan Yang, In Tae Ryoo (Kyung Hee University, Korea)

P-1.36 Throughput Enhancement with Carrier Selection for LTE in Unlicensed Band

Hoiyoon Jung, Jungsun Um and Sungjin You, Seung Keun Park (Electronics and Telecommunications Research Institute, Korea)

P-1.37 Active Interference Restriction in OFDM-Based Cognitive Radio Network Using Genetic Algorithm

Hamza Khan and Sang-jo Yoo (Inha University, Korea)

P-1.38 Audience's Viewing Behavior Analysis for Inferencing Consumer Preferences

Sang-Yun Lee, Jeong-Woo Son, Sunjoong Kim and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

P-1.39 A Research on VNF-enabled Radio Access Network for UDN using Low-cost Compute Node

Misun Ahn and Sungwon Lee (Kyung Hee University, Korea)

P-1.40 An approach of Webcast Event Clustering for Sport Video Event Annotation

Gyeong-June Hahm and Kee Seong Cho (Electronics and Telecommunications Research Institute, Korea)

P-1.41 Design of Smart Broadcasting Scenario for Media Commerce Services

Sang-Yun Lee, Jeong-Woo Son, Sunjoong Kim and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

P-1.42 A Research on Flexible Enterprise WLAN System based Web of Place Access Points

Seunghyun Hong and Sungwon Lee (Kyung Hee University, Korea)

P-1.43 Making a Video Smart for Smart E-Learning

Seyoung Huh, Yoo-mi Park, Jonghyun and Wan Choi (Electronics and Telecommunications Research Institute, Korea)

P-1.44 Advanced Technologies for Smart Exhibition Guide Services

Hyungkeuk Lee, Sung-Hee Kim, Hyun-Woo Lee (Electronics and Telecommunications Research Institute, Korea)

P-1.45 Multiuser-Multiview Contents Interaction

Hye-Jin Kim, Seunghyup Shin, Jin Ryoung Kim and Il-Kwon Jeon (Electronics and Telecommunications Research Institute, Korea); Hyeran Park (VinyI, Inc., Korea)

P-1.46 Asymptotic Analysis of Space-Time Block codes in Spatially Correlated Nakagami Fading Channels

Donghun Lee and Seung Keun Park (Electronics and Telecommunications Research Institute, Korea)

P-1.47 A Study on Reducing Spectrum Edge of OFDM Signal

Jaeho Lee, Woongshik You and Jintae Oh (Electronics and Telecommunications Research Institute, Korea)

P-1.48 Multi-Layer Resource and Path Management in MPLS-TP based Packet and Optical Switched Multi-layer Transport Network

Kiwon Kim, Sunme Kim and Taehyun Kwon (Electronics and Telecommunications Research Institute, Korea)

P-1.49 Performances of RLS Algorithm for Smart Antennas in Mobile Communication System

Prakash Thapa, Jong-gil Baek, Hye Ji Jeon, Hye Jin Lee, Min-A Jung and Seong Ro Lee (Mokpo National University, Korea)

P-1.50 Device Failure Detection Algorithm over MAC for Radio Resource Efficiency based on IEEE 802.15.4

Sun-Hwa Lim, Young-il Kim and Yong-Tae Lee (Electronics and Telecommunications Research Institute, Korea)

P-1.51 Analysis of UGP to achieve compatibility with Cooperative ITS station

Hyun-Jeong Yun and Jeong Dan Choi (Electronics and Telecommunications Research Institute, Korea)

P-1.52 Sum-Rate Analysis of Two-Way Multi-relay Multi-user MIMO Networks with Mulit-hop Precoding

Mohammad Abu Hanif, Moon Ho Lee (Chonbuk National University, Korea)

P-1.53 Co-existence analysis of duty cycle method with Wi-Fi in unlicensed bands

Suna Choi and Seungkeun Park (Electronics and Telecommunications Research Institute, Korea)

P-1.54 Analysis of Channel Access Mechanism on 5 GHz Unlicensed Band

Jungsun Um and Seungkeun Park (Electronics and Telecommunications Research Institute, Korea); Yunbae Kim (Korea Advanced Institute of Science and Technology, Korea)

P-1.55 A Hybrid Transmission Technique for IoT Networking Environment

Hangki Joh, In Hwan Yang, In Tae Ryoo (Kyung Hee University, Korea)

P-1.56 Rendezvous for Self-Organizing MANET with multiple radio

Kyung-yul Cheon, Chang-Joo Kim (Electronics and Telecommunications Research Institute, Korea); Jun Kyun Choi (Korea Advanced Institute of Science and Technology, Korea)

P-1.57 An Implementation of PC State Management in IP Networks

Sungwon Byon, Eunjung Kwon and Eui-Suk Jung, Yong-Tae Lee and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

P-1.58 Optimal Pilot Design for Space-Time Coded Multi-user MIMO OFDM/SDMA Systems

Zhe Zhang, Jiankang Zhang, Shuangzhi Li and Xiaomin Mu (Zhengzhou University, P.R. China)

P-1.59 What kinds of "Things" Should be Considered in Designing Trust for IoTs Applications?: a Multi-disciplinary Review

Young Seog Yoon and Hyun-Woo Lee (Electronics and Telecommunications Research Institute, Korea)

P-1.60 Architecture Design of Ground Telecommand Encryption Function for Spacecraft

In Jun Kim and Byoung-Sun Lee (Electronics and Telecommunications Research Institute, Korea)

P-1.61 Prediction Model to Computing Resources using Simulation Parameter and Data in the Web-based Computational Simulation Environment

Jinseung Yu (Korea Institute of Science and Technology Information, Korea); Jaecheol Ryou (Chung-Nam National University, Korea)

P-1.62 Seamless Image Stitching Using Structure Deformation with HoG Matching

Seohyoung Lee, Youngtae Park and Daeho Lee (Kyung Hee University, Korea)

P-1.63 Mobile Data Offloading Service using File Cloud in Small Cells

Ki-Sook Chung and Changsup Keum (Electronics and Telecommunications Research Institute, Korea)

P-1.64 Orthogonal Frequency Division Multiplexed Passive Optical Access Transmission with Improved Transmission Capacity by the use of Adaptive Sampling based on Compressed Sensing

Yong-Yuk Won, Dongsun Seo and Sang Min Yoon (Kookmin University, Korea)

P-1.65 A Novel Approach for User-Centric Work Environment

Juyoung Park and SungKee Noh (Electronics and Telecommunications Research Institute, Korea)

P-1.66 Critical Factors in IT Project Teams

Michiko Miyamoto (Akita Prefectural University, Japan)

P-1.67 Distributed media processing on multiple computing servers

KangWoon Hong, Hyun-Woo Lee and Jun Kyun Choi (Electronics and Telecommunications Research Institute, Korea)

P-1.68 Human Movement Tracking Method Using Inertial Sensors for Localization in Wide Spaces

Joonseong Gim, Bong-young Woon, Sang-Sun Lee and Dong-Ho Choi (Hanyang University, Korea)

P-1.69 Performance Comparison of Backoff Protocols and Their Co-Existence with Legacy WLAN

Igor Kim and Seung Keun Park (Electronics and Telecommunications Research Institute, Korea)

P-1.70 Network Resilience Estimation to Cascading Failures

Yong-Hyuk Moon, YongSung Jeon (Electronics and Telecommunications Research Institute, Korea)

P-1.71 Architecture of Geospatial Big-Data Batch Processing Model Based on Hadoop

Sangsu Kim and Sung-Hwan Yu (ICTWAY, Korea)

P-1.72 Development of active state measurements system for the cells in solution

Tenshin Honda, Naoki Konishi, MinChul Lee and Naoki Konishi (Kyushu Institute of Technology, Japan)

P-1.73 Performance Analysis of Degradation Detection Method on Millimeter Wave Channel

Manho Park and Y.S. Choi (Electronics and Telecommunications Research Institute, Korea)

P-1.74 Outage probability analysis of spectrum sharing systems in small cell networks

Sunghyun Hwang and Seungkeun Park (Electronics and Telecommunications Research Institute), Korea)

P-1.75 Noninvasive Heartbeat Extraction from IR UWB Radar Signals

Hui-Sup Cho, Hong-Kun Lyu and Young-Jin Park (DGIST, Korea)

P-1.76 V2X Throughputs Based on Link Budget Analysis for 5.8GHz WAVE Systems

Yoo-seong Song, Jeong-Dan Choi (Electronics and Telecommunications Research Institute, Korea)

P-1.77 The Design of Satellite Mesh Protocol for the DVB-RCS TDMA Networks

Min-Su Shin, JoonGyu Ryu and DeokGil Oh (Elecrtonics and Telecommunicaions Research Institute, Korea

P-1.78 Comparison of COTS Inertial Sensors for getting Marine Elevator's tilt values

JaeMyoung Kim (Electronics and Telecommunications Research Institute, Korea); Young-Gwan Kang (Delco Elevator, Korea); JaeHong Yim (Korea Maritime and Ocean University, Korea); Yoon-Yong Park (SunMoon University, Korea)

P-1.79 Applications of Interference Alignment in D2D Communications

Yunpeng Li, Zeeshan Kaleem and KyungHi Chang (Inha University, Korea)

P-1.80 **Design and implementation of touch-link algorithm for reducing the link connection time in ZigBee**

Jung-Sik Sung, Jongwoo Choi, Seong Hee Park and Tae-Gyu Kang (Electronics and Telecommunications Research Institute, Korea)

P-1.81 **Design and implementation of high speed A/D Converters using Time Interleaving**

Young Woo Choi, Do Wook Kang and Dong Kyoo Kim (Electronics and Telecommunications Research Institute, Korea)

P-1.82 **On Supporting User-defined Collaborative Workspace over Cloud Storage**

Jae-hwan Jin and MyungJoon Lee (University of Ulsan, Korea)

P-1.83 **Analysis of Design space and Use case in IPv6 over NFC for Resource-constrained IoT devices**

Yong-Geun Hong, Younghwan Choi and Myung-Ki Shin (Electronics and Telecommunications Research Institute, Korea); Joo-Sang Youn (Dongeui University, Korea)

[Session II-1] SDN and Network Function Virtualization

Oct. 28, 16:00-17:40

Chair: Dr. Michiko Miyamoto (Akita Prefectural University, Japan)

II-1.1 **A Network Topology-aware Selectively Distributed Firewall Control in SDN**

Thuy Vinh Tran and Heejune Ahn (Seoul National University of Technology, Korea)

II-1.2 **The study of Dynamic Topology Remapping in Virtual Network Embedding**

Hang Li, Tianyang Zhou and Qingxian Wang (National Digital Switching System Engineering & Technological Research Center, P.R. China)

II-1.3 **Approaches for Improving Tuple Space Search-based Table Lookup**

HyunYong Lee and BhumCheol Lee (Electronics and Telecommunications Research Institute, Korea)

II-1.4 **Network Deployment and Implementation for Access Control with Open Source Based VNF**

Yumi Oh and Sungwon Lee (Kyung Hee University, Korea)

II-1.5 **A Self-recovery Scheme for Service Function Chaining**

Seung-Ik Lee, Myung-Ki Shin (Electronics and Telecommunications Research Institute, Korea)

II-1.6 **A Multiple Flow Tables Construction Scheme for Service Function Chaining in NFV**

Eun-Do Kim (University of Science and Technology, Korea); Seung-Ik Lee, YunChul Choi, Myung-Ki Shin and Hyoung Jun Kim (Electronics and Telecommunications Research Institute, Korea)

[Session II-2] Advanced Wireless & Mobile Communication Systems and Infrastructure

Oct. 28, 16:00-17:40

Chair: Prof. Jin-Ho Chung (UNIST, Korea)

II-2.1 **On Effects of Feedback Delay in Secure Buffer-Aided Relay Networks**

Anish Prasad Shrestha and Kyung Sup Kwak (Inha University, Korea)

II-2.2 **High Performance And Low Complexity Two Symbols ISDIC Turbo Equalizer**

Doron Shinbox and Dan Raphaeli (Tel-Aviv University, Israel)

II-2.3 **Performance of Rolling Shutter and Global Shutter Camera in Optical Camera Communications**

Thithanhnhan Le, Nam Tuan Le and Yeong Min Jang (Kookmin University, Korea)

II-2.4 **The Design of Low Power High Gain Transformer Feedback Amplifier**

Suk-hui Lee, Ki-Jin Kim and Kwang-Ho Ahn (Korea Electronics Technology Institute, Korea); Sung-il

Bang (Dankook University, Korea)

II-2.5   Random Access Method with Access Time Distribution Scheme

Hyun-Yong Hwang, Sung-Min Oh, Jae Heung Kim and Jaesheung Shin (Electronics and Telecommunications Research Institute, Korea)

II-2.6   Performance Analysis of Cooperative Communication System with Feedback Delay and Channel Estimation Error

Aymen Omri and Mazen Omar Hasna (Qatar University, Qatar)

[Session II-3] Smart Media & Broadcasting and Smart Devices/Applications

Oct. 28, 16:00-17:40

Chair: Prof. Hongyeop Song (Yonsei University, Korea)

II-3.1   Real-Time Mimicking of Estonian Speaker's Mouth Movements on a 3D Avatar Using Kinect 2

Iiris Lüsi, Gholamreza Anbarjafari (University of Tartu, Estonia); Einar Meister (Tallinn University of Technology, Estonia)

II-3.2   Standby Mode Control based on Network Assistance for Power Saving of a Set-Top Box

Hyunho Park, Sungwon Byon, Eui-Suk Jung, Young-Su Park, Yong-Tea Lee and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

II-3.3   A Smart Sensor System for Air Quality Monitoring and Massive Data Collection

Yonggao Yang and Lin Li (Prairie View A&M University, USA)

II-3.4   MOSQUITO: Mobile video streaming protocol for the high level QoE provisioning over heterogeneous wireless access networks

Min Ho Park (LG uplus & Korea Advanced Institute of Science and Technology, Korea); Jun Kyun Choi (Korea Advanced Institute of Science and Technology, Korea); Daewon Song (LG uplus, Korea); JungYul Choi (Sungkyul University, Korea)

II-3.5   A Study on Common Phase Rotation Compensation for Coaxial Transmission Systems in the HFC network

JaeHwui Bae, JinHyuk Song, Sang-Jung Ra, Dong-Joon Choi and Namho Hur (Electronics and Telecommunications Research Institute, Korea)

[Session II-4] Mobile/Wireless Technologies and Indoor Positioning/Navigation Systems

Oct. 28, 16:00-17:40

Chair: Prof. Seung-Hoon Hwang (Dongguk University, Korea)

II-4.1   Architecture and Features for 5G Mobile Personal Cell

Zeeshan Kaleem, Yunpeng Li and KyungHi Chang (Inha University, Korea)

II-4.2   Evaluating Indoor Positioning Errors

Teemu Pulkkinen and Johannes Verwijnen (Ekahau Oy, Finland)

II-4.3   Continuous Location Tracking of People by Multiple Depth Cameras

Young-Ho Suh, Sang Keun Rhee and Kang-Woo Lee (Electronics and Telecommunications Research Institute, Korea)

II-4.4   A Novel Pre-active Routing based Positioning Scheme for Location Based Services in Indoor Environment

Jie Zhang, Ning Sun and Guangjie Han (Hohai University, P.R. China); Yiqi Gui (Yangzhou University, P.R. China)

II-4.5 **FM based indoor localization and mapping system with real-time implementation on FPGA**
Amartansh Dubey, Abhinav Kulkarni, Anubhav Paras, Aditya Deole, Abhay Gandhi, Kishore Bhurchandi (Visvesvaraya National Institute of Technology, India)

[Session II-5] Emerging Issues in Communications

Oct. 28, 16:00-17:40

Chair: Prof. Cesar Azurdia Meza (Universidad de Chile, Chile)

II-5.1 **An Efficient Search on Puncturing Patterns for Short Polar Codes**
Jaeyoel Kim (Samsung Electronics, Korea); Jong-hwan Kim and Sang-Hyo Kim (Sungkyunkwan University, Korea)

II-5.2 **Reducing Feedback Using Compressive Sensing for Energy Harvesting MISO Systems**
Thu L. N. Nguyen and Yoan Shin (Soongsil University, Korea)

II-5.3 **Channel Capacity Analysis for High Speed Controller Area Network (CAN)**
Eunmin Choi, Sungmin Han and Ji-Woong Choi (DGIST, Korea)

II-5.4 **New LIPA/SIPTO Offloading Algorithm by Network Condition and Application QoS Requirement**
Hye-Rim Cheon (Ajou University, Korea); Seung-Que Lee (Electronics and Telecommunications Research Institute, Korea); Jae-Hyun Kim (Ajou University, Korea)

II-5.5 **Energy Harvesting for Cooperative Wireless Sensor Networks with a Nonlinear Power Consumption Model**
Van-Dinh Nguyen and Oh-Soon Shin (Soongsil University, Korea)

II-5.6 **Mobility Enhancement in Centralized mmWave-based Multi-Spot Beam Cellular System**
Soon-Gi Park and Yong-Seouk Choi (Electronics and Telecommunications Research Institute, Korea)

[Workshop II] Enabling Techniques for Future Mobile Communications (5G/6G) Part II

Oct. 28, 16:00-17:40

Chair: Prof. Chung G. Kang (Korea University, Korea)

W-II.1 **Effect of Timing and Frequency Synchronization Errors on GFDM Systems**
Jae-Hyung Choi, Byung-Ju Lim, Young-Jun Kim and Young-Chai Ko (Korea University, Korea)

W-II.2 **Design of Non-linearity about Quadratic Amplitude Modulation in an Impulsive Noise Environment**
Hyungkook Oh and Haewoon Nam (Hanyang University, Korea)

W-II.3 **Effect of Phase Noise in IEEE 802.11ad MIMO-OFDM Systems with Common/Independent Local Oscillators**
Min-hwa Jeong, Tae-jun Lee, Myeong-Jin Kim and Young-Chai Ko (Korea University, Korea)

W-II.4 **Asymptotic Error Rate Approximation of Amplify-and-Forward Cooperative Diversity Network with Relay Selection**
Minhwan Choi and Haewoon Nam (Hanyang University, Korea); Hoojin Lee (Hansung University, Korea)

W-II.5 **A Hyperbolic Distance Measurement Model for Range-Free Localization in Anisotropic Networks**
Sangwoo Lee, Hyowon Kim (Hanyang University, Korea); Cheonsig Shin (Electronics and Telecommunications Research Institute, Korea); Chansik Park (Chungbuk National University, Korea); Min-Joon Lee (Agency for Defense Development, Korea); Sunwoo Kim (Hanyang University, Korea)

Technical Paper Sessions

W-II.6 A Beamforming Technique for LTE-based Mobile Relay Stations
Rothna Pec and Yong Soo Cho (Chung-Ang University, Korea)

October 29 (Thursday), 2015

[Session III-1] Advanced Wireless & Mobile Communication Systems and Infrastructure

Oct. 29, 09:00-10:40

Chair: Dr. Dani Raphaeli (Tel Aviv University, Israel)

III-1.1 Inter-User Interference Cancellation Improvements for LTE-Advanced Random Access Detector using Dynamic Thresholding Mechanism
Tomo Morohashi, Chun-Hao Liao, Aoi Koizuka, Makoto Suzuki and Hiroyuki Morikawa (The University of Tokyo, Japan)

III-1.2 Adaptive data rate transmission between vehicle and access point
Seong-Hyung Lee, Seong Hee Lee, Seung-il Jeong and Seung-Hoon Hwang (Dongguk University, Korea)

III-1.3 VoLTE SRVCC Optimization as Interim Solution for LTE Networks with Coverage Discontinuity
Myleen Dosado Villaluz, Ragil Putro Wicaksono, Adrian Dan Ebora Atienza, Seiji Kunishige, Kwangrok Chang (MOTiV Research Co., Japan)

III-1.4 Design of Distributed Space Time Trellis Codes with DF Relaying in Slow Rayleigh Fading Channels
Sung-Kwon Hong (Interdigital Asia LLC, Korea); Jong-Moon Chung (Yonsei University, Korea)

III-1.5 Investigation on Resource Selection Scheme Based on Proportional Fair Criteria
Nobuhiko Miki and Takeshi Takemoto (Kagawa University, Japan)

[Session III-2] M2M/IoT/IoE/WoT Communication Infrastructure and Applications

Oct. 29, 09:00-10:40

Chair: Dr. Gonzalo Huerta-Canepa (Universidad Adolfo Ibanez, Chile)

III-2.1 An Efficient Joining Scheme in IEEE 802.15.4e
Thang Phan Duy and YoungHan Kim (Soongsil University, Korea)

III-2.2 User-Centric Thing Environment Service Platform
Eungha Kim and Changsup Keum (Electronics and Telecommunications Research Institute, Korea)

III-2.3 Sensor data fusion among neighbors in wireless networks
Bao Yu, Tang Haijian, Tang Chaogang, Zhaoliang (China University of Miining & Technology, P.R. China)

III-2.4 A Novel Localization Algorithm for Internet of Things in 3D
Mian Imtiaz ul Haq and Dongwoo Kim (Hanyang University, Korea)

III-2.5 An implementation of active network for multi radio access technology: Function Oriented-Networking
Young-Bo Sim, Sungwon Lee (Kyung Hee University, Korea)

III-2.6 Performance of Multi-Sequence Spreading Random Access for Machine-Type Communication
Ameha T. Abebe and Chung G. Kang (Korea University, Korea)

Technical Paper Sessions

[Session III-3] Services/Applications and Smart Media/Devices

Oct. 29, 09:00-10:40

Chair: Dr. Sangmi Lee (IITP, Korea)

III-3.1 A Unified Social Network Service Model for Enhancing Privacy and Message Gain
Narae Hwang and Sanghwan Lee (Kookmin University, Korea)

III-3.2 Which is the Best Quality Video?
Yongseok Seo and Wonyoung Yoo (Electronics and Telecommunications Research Institute, Korea)

III-3.3 Design of High Speed CCD Data Acquisition System Based on FPGA and USB3.0
Qian Yujie (Hohai University, P.R. China); Ke Cui (Nanjing University of Science and Technology, P.R. China)

III-3.4 Smart Vision System for Soccer Training
Jongsung Kim and Myunggyu Kim (Electronics and Telecommunications Research Institute, Korea)

III-3.5 Medical Image Segmentation by Improved 3D Adaptive Thresholding
Cheol-Hwan Kim and Yun-Jung Lee (Kyungpook National University, Korea)

III-3.6 Utilizing External Information on Contents for Broadcasting Services
Jeong-Woo Son, Alex Lee, Sang-Yun Lee, Sun-Joong Kim and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

[Session III-4] Advanced Communication Networks and Future Internet Technologies

Oct. 29, 09:00-10:40

Chair: Dr. Suguru Kameda (Tohoku University, Japan)

III-4.1 Analysis of Telemetering Service in OpenStack
Dongmyoung Baek and Bumchul Lee (Electronics and Telecommunications Research Institute, Korea

III-4.2 Practical User Scheduling Algorithms for the MIMO Interference Channel
Fermin Maciel Barboza, Jaime Sánchez García and Francisco R. Castillo-Soria (CICESE Research Center, Mexico); Leonel Soriano-Equigua and Victor Castillo Topete (University of Colima, Mexico)

III-4.3 A Protection Switching Management of Two-Layer Transport Networks with MPLS-TP over OTN
Dae-Ub Kim (Electronics and Telecommunications Research Institute & Chungnam National University, Korea); ByungChul Kim and JaeYong Lee (Chungnam National University, Korea)

III-4.4 Smart Video Packet Trimming Technique over Congested Networks
Amer Zaheer, Tariq Saraj, Asim Rasheed and Amir Qayyum (Mohammad Ali Jinnah University, Islamabad, Pakistan); Touseef Javed (COMSATS Institute of Information Technology, Pakistan)

III-4.5 System Capacity Enhancement of MmWave Based 5G Mobile Communication System
JungSook Bae and Yong Seouk Choi (Electronics and Telecommunications Research Institute, Korea)

III-4.6 Energy Efficient Modulation technique on 10Gb/s Coherent detection optical OFDM
Muhammad Towfiqur Rahman, Khaizuran Abdullah, Md Rafiqul Islam and Md Shahidul Islam Faruqi (International Islamic University Malaysia, Malaysia)

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[Session III-5] Emerging Signal Processing Techniques for Wireless Communications and Storage

Oct. 29, 09:00-10:40

Chair: Prof. Jun-Pyo Hong (Pukyong National University, Korea)

III-5.1 **On the Performance of Quantized DMT Signals**
João Guerreiro, Rui Dinis and Paulo Montezuma (FCT-UNL, Portugal)

III-5.2 **Sparse Multi-Carrier Index Keying OFDM with Index Separation over Correlated Sub-Carriers**
Youngwook Ko (Queen's University Belfast, United Kingdom); Jinho Choi (Gwangju Institute of Science and Technology (GIST), Korea)

III-5.3 **Energy Efficient Implementation of Soft Iterative MIMO Detection**
Sooyoung Kim, Saleem Ahmed, Meixiang Zhang and Fabrice Claude Ngayahala (Chonbuk National University, Korea))

III-5.4 **Advanced Channel Signal Processing for Multi-track or Multi-wordline Data Storage Systems**
Euiseok Hwang (Gwangju Institute of Science and Technology, Korea)

III-5.5 **Applying an Innovative Semantic Sensor Network Model in Internet of Thing**
Mohammadreza Rezvan (University of Isfahan, Iran); Mohammadamin Barekatain (Technical University of Munich, Germany); Kazem Taghandiki and Ahmad Zaeri (University of Isfahan, Iran)

[Session P-2] Poster Session 2

Oct. 29, 09:00-10:40

Chair: Prof. Kyoung-Young Song (Ulsan College, Korea)

P-2.1 **Reliable Detection and Skew Correction Method of License Plate for PTZ camera-based License Plate Recognition System**
Toan Nguyen, Nguyen Binh and Sun-Tae Chung (Soongsil University, Korea)

P-2.2 **Smart memo Service Design for Augmented Smart Space**
Sang Keun Rhee, Young-Ho Suh and Kangwoo Lee (Electronics and Telecommunications Research Institute, Korea)

P-2.3 **A Contention based Uplink Scheduling Request Method in LTE-A**
Nam-Suk Lee and YongSeouk Choi (Electronics and Telecommunications Research institute, Korea)

P-2.4 **Full Dimension MIMO Antenna Configuration for Optimal Performance**
Alidu Abubakari, Sabogu-Sumah Raymond and Han-Shin Jo (Hanbat National University, Korea)

P-2.5 **Technology Trends of Access Control in IoT and Requirements Analysis**
Yun-kyung Lee, Jae-deok Lim, Yong-seong Jeon and Jeong-nyeo Kim (Electronics and Telecommunications Research Institute, Korea)

P-2.6 **Evaluation of multi-path resolution for millimeter wave channel sounding system**
Heon Kook Kwon, Myung-Don Kim and Jinyi Liang (Electronics and Telecommunications Research Institute, Korea)

P-2.7 **Compatibility between LTE and Airport Surveillance Radar in 2700-2900 MHz radar bands**
Sabogu-Sumah Raymond, Alidu Abubakari and Han-Shin Jo (Hanbat National University, Korea); Heon-Jin Hong and Ho Kyung Son (Electronics and Telecommunications Research Institute, Korea)

P-2.8 **Performance Evaluation of LTE-Unlicensed in Handover Scenarios**
Jaewook Lee, Haneul Ko and Sangheon Pack (Korea University, Korea)

P-2.9 **SNR Weighted LLR Combining Method in Uplink mmWave Environment**

Young-jin Moon (Electronics and Telecommunications Research Institute, Korea); Whan Woo Kim (Chungnam National University, Korea)

P-2.10 **GMPS(Group based Multi-Level Packet Scheduling) Method in Multi-beam based Mobile Communication System**

Sook-Jin Lee and Yong Seouk Choi (Electronics and Telecommunications Research Institute, Korea)

P-2.11 **Group Handover Management for V2x in Moving cell based LTE-Advanced System**

You-sun Hwang and Jaewook Shin (Electronics and Telecommunications Research Institute, Korea)

P-2.12 **A Regular Expressions Matching Algorithm Based on Templates Finite Automata**

Yuchong Li, Xingguo Luo and Xiangyu Shao (National Digital Switching System Engineering & Technological Research Center, P.R. China); Dong Wei (North China University of water Resources and Electric Power, P.R. China)

P-2.13 **Enhancement Method according to the Estimation of Noise Variance for the Turbo Decoder**

InKi Lee, DeokGil Oh (Electronics and Telecommunications Research Institute, Korea); WangRok Oh (Chungnam National University, Korea)

P-2.14 **Idle Terminal's Re-connection Minimizing Procedure in the Network**

Min-Suk Choi and Yongseouk Choi (Electronics and Telecommunications Research Institute, Korea)

P-2.15 **An OAuth based Authentication Mechanism for IoT Networks**

Shamini Emerson, Young-Kyu Choi, Dong-Yeop Hwang, Kang-Seok Kim and Ki-Hyung Kim (Ajou University, Korea)

P-2.16 **Encoding of Korean Characters with Less Radix in Format-Preserving Encryption**

Keonwoo Kim and Sang-Su Lee (Electronics and Telecommunications Research Institute, Korea)

P-2.17 **A Packet-Relaying Method in Wireless Sensor Communications**

Kunmin Yeo, Youngil Kim, Yongtae Lee and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

P-2.18 **Extensible Privacy Framework for Web of Objects Based Ubiquitous Services**

Muhammad Ansar Latif, Farman Ullah and Sung Chang Lee (Korea Aerospace University, Korea)

P-2.19 **A Software integration architecture for support of the large-capacity memory**

Gyu-Il Cha, Young-Ho Kim, Eun-Ji Lim and Seung-Jo Bae (Electronics and Telecommunications Research Institute, Korea)

P-2.20 **A Cooperative Retransmission Scheme in High Dense Networks**

Jihyung Kim and Jaesheung Shin (Electronics and Telecommunications Research Institute, Korea)

P-2.21 **Binary Locally Repairable Codes from Complete Multipartite Graphs**

Jung-Hyun Kim, Mi-Young Nam and Hong-Yeop Song (Yonsei University, Korea)

P-2.22 **RF Transceiver for wireless backhaul system**

Minsoo Kang, B.S. Kim, K.S. Kim, W.J. Byun, I.K. Kim and M.S. Song (Electronics and Telecommunications Research Institute, Korea)

P-2.23 **Implementation Design and Performance Analysis of Legacy DER communication to IEC 61850 Server**

Yoon-Sik Yoo, Taein Hwang and Il-Woo Lee (Electronics and Telecommunications Research Institute, Korea); Jun Kyun Choi (Korea Advanced Institute of Science and Technology, Korea)

P-2.24 **A User-Aware Broadcast Scheme using Rate-Adaptive Coded Transmission**

Jinho Choi (GIST, Korea); Jeongseok Ha (Korea Advanced Institute of Science and Technology, Korea)

Technical Paper Sessions

P-2.25 Amplitude Mismatch Effect Analysis of 18 GHz 2x2 LoS MIMO System

Bongsu Kim, Min-Soo Kang, Kwang-Seon Kim, Woo-Jin Byun and Myung-Sun Song (Electronics and Telecommunications Research Institute, Korea)

P-2.26 Anomaly detection of access patterns in database

Jong-Hyuk Roh, Sung-Hun Lee, Soohyung Kim (Electronics and Telecommunications Research Institute, Korea)

P-2.27 Security Considerations for Secure and Trustworthy Smart Home System in the IoT Environment

Jin-Hee Han, YongSung Jeon and Jeong Nyeo Kim (Electronics and Telecommunications Research Institute, Korea)

P-2.28 MDC-DFA: A Multi-dimensional Cube Deterministic Finite Automata-Based Feature Matching Algorithm

Yuchong Li, Xingguo Luo and Xiangyu Shao (National Digital Switching System Engineering & Technological Research Center, P.R. China); Dong Wei (North China University of water Resources and Electric Power, P.R. China)

P-2.29 Trusted Military Services Based on the Secure Domain of the Mobile Security Solution

GeonLyang Kim, JaeDeok Lim, YongSung Jeon and JeongNyeo Kim (Electronics and Telecommunications Research Institute, Korea)

P-2.30 Wideband Satellite Transmission in DVB-S2 System using Time-slicing Method

Sooyeob Jung and Deock-Gil Oh (Electronics and Telecommunication Research Institute, Korea)

P-2.31 Performance of MIMO Detectors with a Capacity-Approaching Code

Seol-Jun Yoon, Joongho Lee and Seokhyun Yoon (Dankook University, Korea)

P-2.32 Augmented Reality Information Registration for Head-Up Display

Changrak Yoon and Kyong-Ho Kim (Electronics and Telecommunications Research Institute, Korea)

P-2.33 Standardization strategy for the Internet of wearable things

Hongki Cha, Wonsuk Lee and Jong hong Jeon (Electronics and Telecommunications Research Institute, Korea)

P-2.34 Experimental Demonstration of LED-based Vehicle to Vehicle Communication under Atmospheric Turbulence

Yong-Hyeon Kim, Willy Anugrah Cahyadi and Yeonho Chung (Pukyong National University, Korea)

P-2.35 The Effects of Augmented-Reality Head-Up Display System on the Perception of Precautionary Situation

Yoonsook Hwang, Byoung-Jun Park, Kyong-Ho Kim (Electronics and Telecommunications Research Institute, Korea)

P-2.36 Network Capacity and Reliable Transmission in Ultra-Dense Networks Sharing Multiple Carriers

Sung Kyung Kim, Jee-Hyeon Na and Dong-Seung Kwon (Electronics and Telecommunications Research Institute, Korea)

P-2.37 Study of LTE - R X2 Handover based on A3 event Algorithm using MATLAB

Ehab Ahmed Ibrahim (Arab Academy for Science, Technology and Maritime Transport, Egypt); Mohamed Rizk (Alexandria University, Egypt); Ehab F. Badran (Arab Academy for Science, Technology and Maritime Transport, Egypt)

P-2.38 A Study of Issues and Considerations for Development of a Vehicle AR System

Jeong-Woo Lee, Byoung-Jun Park, Changrak Yoon and Kyong-Ho Kim (Electronics and Telecommunications Research Institute, Korea)

Technical Paper Sessions

P-2.39 Performance Analysis by Burst Overhead Length in Symmetric-rate 10G-EPON Reach Extender
Kwang-Ok Kim and Hwan Seok Chung (Electronics and Telecommunications Research Institute, Korea)

P-2.40 Implementation of ICT-based Building Ongoing Commissioning System
Jong-Won Kim, Tae Hyung Kim, Jong Woo Choi, Youn Kwae Jeong and Il Woo Lee (Electronics and Telecommunications Research Institute, Korea)

P-2.41 Mobile Security Technology for Smart Devices
Seungyong Yoon, Yongsung Jeon and Jeongnyeo Kim (Electronics and Telecommunications Research Institute, Korea)

P-2.42 A Method based on Platform Integrity Verification for Activating A Mobile Trusted Module
Daewon Kim, Yongsung Jeon and Jeongnyeo Kim (Electronics and Telecommunications Research Institute, Korea)

P-2.43 Design of High Gain Amplifier using On-Chip Transformer by Neutralization
Ki-Jin Kim, Suk-hui Lee and K. H. Ahn (Korea Electronics Technology Institute, Korea)

P-2.44 Development of the Base-Station Platform for In-Vehicle Wireless Sensor Network System
Doo Seop Yun, Young-Jin Kwon, Seung-Jun Lee and Do Hyun Kim (Electronics and Telecommunications Research Institute, Korea)

P-2.45 UGS Middleware for Monitoring State of Underground Utilities
Kwangsoo Kim, Dong-Hwan Park and Jae Heum Lee (Electronics and Telecommunications Research Institute, Korea); Seong-il Jin (Chungnam National University, Korea)

P-2.46 Development of Communication Interfaces between the Base-Station and the User Device for Wireless Automotive Sensor Network System
Doo Seop Yun, Young-Jin Kwon, Seung-Jun Lee, Do Hyun Kim (Electronics and Telecommunications Research Institute, Korea)

P-2.47 A Study on Millimeter-Wave Beamforming for High-Speed Train Communication
Junhyeong Kim, Hee-Sang Chung, Il Gyu Kim and Hoon Lee (Electronics and Telecommunications Research Institute, Korea); Myong Sik Lee (KMW, Korea)

P-2.48 Millimeter-wave Delay Spread Measurement and Simulation at LoS Urban Low-rise Environments
Jong Ho Kim, Young-Keun Yoon, Young Jun Chong and Heon-Jin Hong (Electronics and Telecommunications Research Institute, Korea)

P-2.49 Narrowband PHY Design and its transmission scheme for AMI Applications
Mi-kyung Oh, Sangsung Choi and Cheol-Ho Shin (Electronics and Telecommunications Research Institute, Korea)

P-2.50 Regulatory and Policy Framework for Cloud, Big Data in Korea
Kure Chel Lee (Electronics and Telecommunications Research Institute, Korea)

P-2.51 An Evolutionary Approach For Security Metric
Seyed Mahmood Hashemi and Jingsha He (Beijing University of Technology, P.R. China)

P-2.52 Smart home Web of Object Architecture
NamKyung Lee, HyungKeuk Lee, HyunWoo Lee and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

P-2.53 Implementation of Smart home Service over Web of Object Architecture
NamKyung Lee, HyungKeuk Lee, HyunWoo Lee and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

P-2.54 The Study of Prediction of Same Attack Group by Comparing Similarity of Domain
Hyeisun Cho, Seulgi Lee, Byung-ik Kim, Youngsang Shin and Taijin Lee (KISA, Korea)

P-2.55 Performance Analysis for Interference Alignment with Integrated Simulator in IEEE 802.11ac Network

Jinhyung Oh, Heon-Jin Hong and Hyung Do Choi (Electronics and Telecommunications Research Institute, Korea)

P-2.56 Color Correction for Stereoscopic Images

Jung-Jae Yu and Chang-Joon Park (Electronics and Telecommunications Research Institute, Korea)

P-2.57 Implementation Structure of Interference Alignment in IEEE 802.11ac PHY Level Simulator

Jinhyung Oh, Heon-Jin Hong and Hyung-Do Choi (Electronics and Telecommunications Research Institute, Korea)

P-2.58 Adaptive Cache Deploying Architecture Using Big-Data Framework for CDN

Tai-Yeon Ku and Hee-Sun Won (Electronics and Telecommunications Research Institute, Korea); Hoon Choi (CNU, Korea)

P-2.59 Optimal Primary-User Mobility Parameters Design of Spectrum Sensing in Cognitive Radio Networks

Min Jia, Guangyu Zhang and Xuemai Gu (Harbin Institute of Technology, P.R. China)

P-2.60 Performance Analysis for Channel Sounding in IEEE 802.11ac Network

Jinhyung Oh, Heon-Jin Hong and Hyung-Do Choi (Electronics and Telecommunications Research Institute, Korea)

P-2.61 Self-provisioning and configuration system for heterogeneous diskless cluster system

Eun-Ji Lim, Young-Ho Kim, Gyu-Il Cha and Seung-Jo Bae (Electronics and Telecommunications Research Institute, Korea)

P-2.62 A Financial Fraud Protection Platform on Android Smartphones in Real-time

Wonjoo Park (Electronics and Telecommunications Research Institute, Korea); Kyong-Ha Lee (KISTI, Korea); Sunjoong Kim and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

P-2.63 Detecting Malware with Similarity to Android applications

Wonjoo Park, Sun-joong Kim and Won Ryu (Electronics and Telecommunications Research Institute, Korea)

P-2.64 Gain Degradation Effect due to Beam Misalignment on mmWave Beamforming for 5G Cellular Communication

Wanhee Kim (University of Science & Technology, Korea); JungSook Bae and Sook-Jin Lee (Electronics and Telecommunications Research Institute, Korea)

P-2.65 XML-based Framework of the Safety Management System in Shipbuilding

YouHee Choi and Byungtae Jang (Electronics and Telecommunications Research Institute, Korea)

P-2.66 Augmented Reality and Representation in Vehicle for Safe Driving at Night

Byoung-Jun Park, Jeong-Woo Lee, Changrak Yoon, Kyong-Ho Kim (Electronics and Telecommunications Research Institute, Korea)

P-2.67 LuxUI: Repurposing Ambient Light Sensor for Contact-based Explicit Interaction on Smartwatch

Hyoseok Yoon, Min-Sung Park, Se-Ho Park and Kyung-Taek Lee (Korea Electronics Technology Institute, Korea)

P-2.68 Automatic Gain Control for ASM channel in maritime communication

Hyungu Hwang and Gi Yoon Park (Electronics and Telecommunications Research Institute, Korea)

P-2.69 Crowd-sourcing Home Energy Efficiency Measurement System

Young-Sung Son, Hyonyung Han, Jun Jo and Jun-Hee Park (Electronics and Telecommunications Research Institute, Korea)

P-2.70 An Efficient Signaling Procedure for Stationary Machine Type Devices

Sung-Min Oh, Hyun-Yong Hwang, Changhee Lee and JaeSheung Shin (Electronics and Telecommunications Research Institute, Korea)

P-2.71 DC Power Shared Data Center Configuration for Cloud Computing

Wonok Kwon and Hagyoung Kim (Electronics and Telecommunications Research Institute, Korea)

P-2.72 Query Reformulation For Specific Domain Search: Keywords, Ontology, Domain Name

Azilawati Azizan, Zainab Abu Bakar (Universiti Teknologi MARA, Malaysia)

P-2.73 A System for Detection of Abnormal Behavior in BYOD based on Web Usage Patterns

Taeeun Kim and Hwankuk Kim (Korea Internet & Security Agency, Korea)

P-2.74 Analysis of ICT Accessibility Policy and Implementation in South Korea

Bong-Keun Jung (Soonchunhyang University, Korea), Chang-Yong Son (Ministry of Science, ICT and Future Planning, Korea), Sung-Woo Park (Woosong University, Korea), Jung-Yeon Kim, Byeong-Gwon Kang (Soonchunhyang University, Korea)

P-2.75 A patient Tracking and Positioning system based on improved DV-Hop algorithm

Bensheng Qi, Hongxia Miao, Xueqi Yuan, and Xuanxuan Xiao (Hohai University, P.R. China)

[Session IV-1] Encryption and Security for ICT Convergence

Oct. 29, 15:30-17:10

Chair: Prof. Jinho Choi (GIST, Korea)

IV-1.1 Power Allocation of Random Masked Beamforming for Guaranteed Secure Communications

Jinho Choi (Gwangju Institute of Science and Technology (GIST), Korea); Jeongseok Ha (Korea Advanced Institute of Science and Technology, Korea)

IV-1.2 Privacy Enhancement for Data Outsourcing

Long Nguyen-Vu, Jungsoo Park, Minho Park and Souhwan Jung (Soongsil University, Korea)

IV-1.3 An Enhanced Approach to Preventing the SSLstripping Attack

Dongwan Shin, Daniel Faireweather, Henry Mozer and Sterling Rinehart (New Mexico Tech, USA)

IV-1.4 Secure Frame Format for Avoiding Replay Attack in Distributed Network Protocol (DNP3)

Kyoung-Young Song (Ulsan College, Korea); Ki-Soon Yu and Daewoon Lim (Dongguk University, Korea)

[Session IV-2] D2D Discovery and Communications

Oct. 29, 15:30-17:10

Chair: Prof. Junsu Kim (Korea Polytechnic University, Korea)

IV-2-1 Feasibility of Capacity Enhancement of Public Safety LTE Using Device-to-Device Communication

Kazushi Muraoka, Jun Shikida and Hiroto Sugahara (NEC Corporation, Japan)

IV-2.2 Game Theory-based Power Allocation Strategy for D2D Communication in Multi-Cell Environment

Seungil Park, Sunghyun Choi and Byeong Gi Lee (Seoul National University, Korea)

IV-2.3 An encryption scheme based on trust for device-to-device communication on 5G

Gonzalo F. Huerta-Cánepa (Universidad Adolfo Ibáñez, Chile)

IV-2.4 On Scheduling with Outdated Channel State Information in ITLinQ for D2D Networks

Kyungmin Lee (Sungkyunkwan University, Korea); Jin Whan Kang (Samsung Electronics, Korea); Sang-Hyo Kim (Sungkyunkwan University, Korea)

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IV-2.5 Resource Allocation for Device-to-Device Communications As an Underlay Using Nash Bargaining Game Theory

Tanhui Liu and Gang Wang (Beijing University of Aeronautics and Astronautics, P.R. China)

IV-2.6 Analysis of Multipath Distribution Characteristics for Device-to-Device Scenarios in Urban Very High-rise Environment

Myung-Don Kim and Juyul Lee, Jinyi Liang, Jinup Kim (Electronics and Telecommunications Research Institute, Korea)

[Session IV-3] IoT/IoE/M2M/WoT Communication Infrastructure and Applications

Oct. 29, 15:30-17:10

Chair: Prof. Saewoong Bahk (Seoul National University, Korea)

IV-3.1 A Thing ID-based IoT Internetworking Framework

Heeyoung Jung (Electronics and Telecommunications Research Institute, Korea)

IV-3.2 Transmission Power Control for Large Scale Industrial Applications in Low Power and Lossy Networks

MingHong Lin, Hyung-Sin Kim and Saewoong Bahk (Seoul National University, Korea)

IV-3.3 Color Transmission in Image Sensor Communications using Display and Camera

Trang Nguyen, Mohammad Arif Hossain, Chang Hyun Hong, Le Nam Tuan and Yeong Min Jang (Kookmin University, Korea)

IV-3.4 Context-Awareness Provisioning to Support User-Centric Intelligence in a Web of Object Platform
Muhammad Golam Kibria and Il Young Chong (Hankuk University of Foreign Studies, Korea)

IV-3.5 Smart sleep care system for quality sleep

Hyonyoung Han, Jun Jo, Young-Sung Son, Jun Hee Park (Electronics and Telecommunications Research Institute, Korea)

[Session IV-4] Advanced Wireless & Mobile Communication Systems and Infrastructure

Oct. 29, 15:30-17:10

Chair: Prof. Le Nam Tuan (Kookmin University, Korea)

IV-4.1 DL Performance Evaluation of a Combined Cell in LTE Network

Rosemarie Miranda Felipe, Jennylou Banzon Caasi, Ragil Putro Wicaksono, Seiji Kunishige and Kwangrok Chang (Motiv Research Co., Japan)

IV-4.2 Capacity of Precoding for MU-MIMO Systems

Taek Keun Lyu and Xin Wang (University of Stony Brook, USA)

IV-4.3 Uplink Control Channel of Mobile Hotspot Network

Sung Woo Choi, Hee Sang Chung and Ilgyu Kim (Electronics and Telecommunications Research Institute, Korea); Jaemin Ahn (Chungnam National University, Korea)

IV-4.4 Scanner Based Load Estimation for LTE Networks

Ragil Putro Wicaksono, Seiji Kunishige and Kwangrok Chang (Motiv Research Co., Japan)

IV-4.5 A Distributed Muting Adaptation Solution for a QoS-Aware User Association and Load Balancing in HetNets

Jihene Ben Abderrazak (University of Carthage, Tunisia); Amina Zemzem (ESPRIT, Tunisia); Hichem Besbes (University of Carthage, Tunisia)

IV-4.6 MIMO-OFDM physical layer emulation using space-frequency coding based on a SDR platform
Sergio Armas- Jiménez, Jaime Sánchez-García, Viktor Rodríguez-Abdalá (Cicese Research Center, Mexico)

[Session IV-5] Smart Radio and Cognitive Radio

Oct. 29, 15:30-17:10

Chair: Prof. Woncheol Lee (Soongsil University, Korea)

IV-5.1 Selection Method of Cluster Head in Wireless Sensor Networks of Wireless Physical Conversion for Spectrum Sharing

Shohei Fujii and Osamu Takyu (Shinshu University, Japan); Takeo Fujii (The University of Electro-Communications, Japan); Mai Ohta (Fukuoka University, Japan); Fumihito Sasamori and Shiro Handa (Shinshu University, Japan)

IV-5.2 Signal Bandwidth Estimation with Energy Detector Based on Windowed FFT for Cognitive Radio System

Kensaku Tamayama, Mai Ohta and Makoto Taromaru (Fukuoka University, Japan)

IV-5.3 Unifying of Frequency Channel for Spectrum Sharing in Wireless Sensor Networks with Star Topology

Takumi Kimura, Osamu Takyu, Fumihito Sasamori and Shiro Handa (Shinshu University, Japan)

IV-5.4 Measured Evaluation of Positioning Accuracy on GNSS for Heterogeneous Wireless System

Hiroshi Oguma, Keita Norishima and Konatsu Suehiro (Toyama College, Japan); Suguru Kameda, Noriharu Suematsu, Tadashi Takagi and Kazuo Tsubouchi (Tohoku University, Japan)

IV-5.5 Received Power Detection under Multiple ON/OFF Environment for Registering Radio Environment Database

Hao Wang, Koya Sato and Takeo Fujii (The University of Electro-Communications, Japan)

IV-5.6 Location-Based Virtual Sector Method for Interference Control in WLAN Multicell Environment

Kohei Akimoto, Suguru Kameda, Akinori Taira, Noriharu Suematsu, Tadashi Takagi and Kazuo Tsubouchi (Tohoku University, Japan)

[Workshop III] Future Coding Techniques for Next Generation Networks

Oct. 29, 15:30-17:10

Chair: Prof. Sungrae Cho (Chung-Ang University, Korea)

W-III.1 Feasibility Study of Stochastic Streaming with 4K UHD Video Traces

Joongheon Kim (Intel Corporation, USA); Eun-Seok Ryu (Gachon University, Korea)

W-III.2 Towards Robust UHD Video Streaming Systems Using Scalable High Efficiency Video Coding

Eun-Seok Ryu, Youngil Ryu and Hyun-Joon Roh (Gachon University, Korea); Joongheon Kim (Intel Corporation, USA); Bok-gi Lee (Gachon University, Korea)

W-III.3 Trend and Challenges of the Diffusion-based Molecular Communication for Nanonetworks

Junho Park, Yeonseok Kim, Sangjun Oh, Kyoungjun Park and Sungrae Cho (Chung-Ang University, Korea)

W-III.4 On Optimizing Random Network Coding Implementation

Heehoon Shin and Joon-Sang Park (Hongik University, Korea)

W-III.5 A New Access Mode for Femtocells in 5G Networks

Nguyen Khac Bao, Souhwan Joung, Minho Park (Soongsil University, Korea)

W-III.6 Effect of Blur Gaussian in MIMO Optical Camera Communications

Nam-Tuan Le, M. A. Hossain, Chang Hyun Hong, Trang Nguyen, Thithanhnhan Le and Yeong Min Jang (Kookmin University, Korea)

Technical Paper Sessions

October 30 (Friday), 2015

[Session V-1] ICN, CDN, CCN, DTN

Oct. 30, 08:30-10:10

Chair: Prof. Sanghwan Lee (Kookmin University, Korea)

V-1.1 Enhanced PRoPHET based on Message Delivery Predictibility in Delay Tolerant Networks
Jae-Choong Nam, Eung-Hyup Kim, Myung-Ki Lee, Geon-Hwan Kim, You-Ze Cho and Shamsur Rahman (Kyungpook National University, Korea)

V-1.2 HERS: High-Efficient Routing Protocol Based on Social Metrics in Mobile Social Network
Tao Jing, Jinghao Qi, Yan Huo, Zhen Li and Jin Qian (Beijing Jiaotong University, P.R. China)

V-1.3 Synchronization among CDN Edge Severs Using P2P Networking
Yeonwoo Nam and Changkyu Lee (University of Science and Technology, Korea); Shingak Kang and Juyoung Park (Electronics and Telecommunications Research Institute, Korea)

V-1.4 Energy-Aware Algorithms for Network-Assisted Device-to-Device Content Delivery Networks
Jihoon Sung, Dujeong Lee and Yonghwan Bang (Korea Advanced Institute of Science and Technology, Korea); Jong Min Lee (SK Telecom, Korea); June-Koo Kevin Rhee (Korea Advanced Institute of Science and Technology, Korea)

V-1.5 Performance Evaluation of Content-Centric LTE Networks
Minsub Lee, Nazib Abdun Nasir, Mahfuz Rahman Bosunia, Seong-Ho Jeong (Hankuk University of Foreign Studies, Korea)

[Session V-2] Information & Communication Theory and Applications

Oct. 30, 08:30-10:10

Chair: Prof. Takeo Fujii (University of Electro-Communications, Japan)

V-2.1 A novel shaping scheme for PAPR Reduction in Single-Carrier Modulation
Yonathan Tate and Dan Raphaeli (Tel Aviv University, Israel)

V-2.2 New Rateless Codes for Receiver With Limited Memory
Bohwan Jun, Pilwoong Yang and Jong-Seon No (Seoul National University, Korea); Hosung Park (Chonnam National University, Korea)

V-2.3 Evaluation of the Improved Parametric Linear Combination Pulse in Digital Baseband Communication Systems
Cesar A. Azurdia-Meza, Angelo Falchetti and Hernán F. Arraño (Universidad de Chile, Chile); Shaharyar Kamal and Kyesan Lee (Kyung Hee University, Korea)

V-2.4 A LoW-Complexity Decoding Algorithm for Concatenated Tree Codes
Daesung Kim and Jeongseok Ha (Korea Advanced Institute of Science and Technology, Korea)

V-2.5 Utilizing Program Visualization in Learning Hardware Programming: Effects of Engagement Level
Siti Rosminah MD Derus and Ahmad Zamzuri Bin Mohamad Ali (Universiti Pendidikan Sultan Idris, Malaysia)

[Session V-3] Big Data, Mobile Cloud Computing, and Advanced Networks

Oct. 30, 08:30-10:10

Chair: Prof. Dongwan Shin (New Mexico Tech, USA)

Technical Paper Sessions

V-3.1 A Survey of Recent Technologies and Challenges in Big Data Utilizations
Jie Zhang, Xiao Yao and Guangjie Han (Hohai University, P.R. China); Yiqi Gui (Yangzhou University, P.R. China)

V-3.2 Resource Management Mechanism for SLA Provisioning on Cloud Computing for IoT
Yeongho Choi and Yujin Lim (University of Suwon, Korea)

V-3.3 Reviewing Academic Social Network Mining Applications
Alireza Abbasi (University of New South Wales (UNSW), Australia)

V-3.4 Comparative Analysis of Real-Time Video Performance in the CCN-based LTE Networks
Seonghyuck Kwon, Kamrul Hasan, Minsub Lee, Seong-Ho Jeong (Hankuk University of Foreign Studies, Korea)

V-3.5 Tunable transceiver with internal λ-locker for time and wavelength multiplexed optical access network
Jie Hyun Lee, Hwan Seok Chung and Joon Ki Lee (Electronics and Telecommunications Research Institute, Korea)

[Session V-4] Vehicular Networks and Security

Oct. 30, 08:30-10:10

Chair: Prof. Changhee Joo (UNIST, Korea)

V-4.1 Resolving Global Synchronization in 2-hop Information Sharing for Periodic Safety Messaging
Byungjo Kim and Hyogon Kim (Korea University, Korea)

V-4.2 Random Access Scheduling with Constant Collision Rate
Seunghyun Lee, Changhee Joo, Hyoil Kim (UNIST, Korea)

V-4.3 CAN Gateway for Fast Vehicle to Vehicle (V2V) Communication
Hyun-Yong Hwang, Sung-Min Oh, JaeSheung Shin (Electronics and Telecommunications Research Institute, Korea)

V-4.4 SDN-based Security Services using Interface to Network Security Functions
Jinyong Kim, Mahdi Daghmehchi Firoozjaei, Jaehoon (Paul) Jeong and Hyoungshick Kim (Sungkyunkwan University, Korea); Jung-Soo Park (Electronics and Telecommunications Research Institute, Korea)

V-4.5 On the Tracking Accuracy of Beaconing Coexistent with Event-Driven Traffic at the DSRC Channel
Hoa-Hung Nguyen and Han-You Jeong (Pusan National University, Korea)

[Session V-5] Emerging Issues in Networking-Invited

Oct. 30, 08:30-10:10

Chair: Prof. Seong-Ho Jeong (Hankuk University of Foreign Studies, Korea)

V-5.1 Analysis of Localization for Drone-fleet
Jin-Hyeok Kang and Kyung-Joon Park (DGIST, Korea); Hwangnam Kim (Korea University, Korea)

V-5.2 Analysis of Asymmetric Hidden Node Problem in IEEE 802.11ax Heterogeneous WLANs
Jaha Mvulla, Eun-Chan Park and Muhammad Adnan (Dongguk University, Korea); Ju-Hyung Son (WILUS Institute of Standards and Technology, Korea)

V-5.3 fMRI Classification Based on Analysis of Variance Combined with Support Vector Machine
Xiaolong Sun and Juyoung Park (Hanyang University, Korea)

V-5.4 **Client Selection for Coordinated IEEE 802.11ac Multi-user MIMO-enabled Access Points**
Seongyong Jeong, Heejun Roh and Wonjun Lee (Korea University, Korea)

V-5.5 **Implementation of a front-end and back-end NDN system for climate modeling application**
Dabin Kim, In chan Hwang, Vartika Srivastava and Young-Bae Ko (Ajou University, Korea); Huhnkuk Lim (California Institute of Technology, USA)

[Session V-6] Systems, Services and Applications for ICT Convergence

Oct. 30, 08:30-10:10

Chair: Prof. Jaehoon Jeong (Sungkyunkwan University, Korea)

V-6.1 **Design of Active Dry Electrodes and its Evaluation for EEG acquisition**
Seungchan Lee, Younghak Shin and Heung-No Lee (Gwangju Institute of Science and Technology, Korea)

V-6.2 **Image Upsizing with Adaptive Wiener Filtering Method using Self-Prediction**
Ilhong Shin, Hyun-Woo Lee (Electronics and Telecommunications Research Institute, Korea)

V-6.3 **Dictionary Update based Adaptive EEG Classification for Real Time Brain-Computer Interface Applications**
Younghak Shin, Seungchan Lee and Heung-No Lee (Gwangju Institute of Science and Technology, Korea)

V-6.4 **Efficient architecture for circle detection using Hough transform**
Sang-Woo Seo and Myunggyu Kim (Electronics and Telecommunications Research Institute, Korea)

V-6.5 **TF-IDF based binary fingerprint search with vector quantization error compensation**
Jihyun Park, Junghyun Kim and Wonyoung Yoo (Electronics and Telecommunications Research Institute, Korea)

[Session VI-1] Advanced Communication Networks and Future Internet Technologies

Oct. 30, 11:10-12:50

Chair: Prof. Heung-No Lee (Gwangju Institute of Science and Technology, Korea)

VI-1.1 **Comparison of WebQoE between 6to4 and Teredo**
Tomohiko Mizoguchi and Yoshihiro Ito (Nagoya Institute of Technology, Japan)

VI-1.2 **Implementing SDN and Network-Hypervisor based Programmable Network using Pi Stack Switch**
Sangyun Han, Sungwon Lee (Kyung Hee University, Korea)

VI-1.3 **A Design of Cooperative Slotted ALOHA System with HARQ**
Hsiao-Chang Yen and Yen-Ching Liu (National Taiwan University, Taiwan); Shih-Kai Lee (Yuan-Ze University, Taiwan); Mao-Chao Lin (National Taiwan University, Taiwan)

VI-1.4 **An Interference-aware Cognitive WLAN for High Density Wireless Environment**
Jie Zhang, Guangjie Han (Hohai University, P.R. China); Yiqi Gui (Yangzhou University, P.R. China)

VI-1.5 **Design of Scalable Link-State Routing in Future Internet**
Wan-Seon Lim and Heeyoung Jung (Electronics and Telecommunications Research Institute, Korea); Woojik Chun (Hankuk University of Foreign Studies, Korea)

VI-1.6 **Impacts of Network Coding on End-to-End Packet Transport Performance**
Yun Kyoung Kim (Kyung Hee University, Korea); Kyoung Yong Park (Ubiquous, Korea); Tae Wan Kim (LG U+, Korea); Jeong Geun Kim (Kyung Hee University, Korea)

Technical Paper Sessions

[Session VI-2] Vehicular Networks and Mobile Networks

Oct. 30, 11:10-12:50

Chair: Prof. Woong Cho (Jungwon University, Korea)

VI-2.1 **Delay-based Geocast Routing Protocol for Message Dissemination in Vehicular Highway Networks**
Zubair Amjad, Khi Jung Ahn and Wang-Cheol Song (Jeju National University, Korea)

VI-2.2 **GORCC: A Global Route Planning Protocol based on Real-time Road Carrying Capability**
Pengfei Duan, Jiayao Tan, Ning Sun and Jie Zhang (HoHai University, P.R. China)

VI-2.3 **Optimum Relay Node Selection for Two-relay Networks in Railway Environments**
Woong Cho (Jungwon University, Korea); Hyunkyun Choi, Jin-Kyu Choi, Hyun Seo Oh and Hanbyeog Cho (Electronics and Telecommunications Research Institute, Korea)

VI-2.4 **Performance Analysis of Content-Centric Networks with Mobility Support**
Nazib Abdun Nasir, Minsub Lee, Mahfuz Rahman Bosunia, Seong-Ho Jeong (Hankuk University of Foreign Studies, Korea)

VI-2.5 **Study on localization of moving objects using Wireless Sensor Networks**
Syed Taqi Abbas, Zainab Ahmed, Ali Inam, Faisal Iradat (Institute of Business Administration, Pakistan)

[Session VI-3] WLAN, WPAN, WBAN, and MANET

Oct. 30, 11:10-12:50

Chair: Prof. Sanghyun Ahn (University of Seoul, Korea)

VI-3.1 **A Study on Medium Access Control Scheme for Energy Efficiency in Wireless Smart Sensor Networks**
Kyunghee Sun and Intae Ryoo (Kyung Hee University, Korea)

VI-3.2 **Investigation of the Effect of Malfunctioned Tags on the Delay Performance of RFID system**
Warakorn Srichavengsup (Thai-Nichi Institute of Technology, Thailand)

VI-3.3 **Multi-Channel TDMA Link Scheduling for Wireless Multi-hop Sensor Networks**
Junhee Lee (University of Science and Technology, Korea); Wun-cheol Jeong (Electronics and Telecommunications Research Institute & University of Science & Technology, Korea)

VI-3.4 **PMAS: A Proposed Mutual Authentication Scheme for Wireless Body Area Networks**
Marwa H. Salama, Sanaa Taha, Hesham N. Elmhady (Cairo University, Egypt)

VI-3.5 **A Geographic Routing Scheme with Dead-End Avoidance for Large-Scale MANETs**
Hyun Yu (KT, Korea), Sanghyun Ahn (University of Seoul, Korea)

[Session VI-4] Mobile Cloud Computing & Communication Systems and Applications

Oct. 30, 11:10-12:50

Chair: Prof. Eun-Seok Ryu (Gachon University, Korea)

VI-4.1 **Android botnet categorization and family detection based on behavioural and signature data**
Tae Oh and Suyash Jadhav (Rochester Institute of Technology, USA); Young Ho Kim (Electronics and Telecommunications Research Institute, Korea)

VI-4.2 **A Distributed File System over Unreliable Network Storages**
Kyunghee Oh and Dooho Choi (Electronics and Telecommunications Research Institute, Korea)

VI-4.3 Conceptual Group Activity Recognition Model for Classroom Environments
Jung In Choi and Hwan-Seung Yong (Ewha Womans University, Korea)

VI-4.4 Virtual Appliance Store Management in Cloud Service Brokerage Platform
Dongjae Kang, Hagyoung Kim and Seokho Son (Electronics and Telecommunications Research Institute, Korea)

[Session VI-5] Spectrum Sharing Towards 5G and IoT

Oct. 30, 11:10-12:50

Chair: Prof. Young-June Choi (Ajou University, Korea)

VI-5.1 A Location-Probability Based Transmit Power Calculation Method for Hybrid TVWS Devices
Hyung Min Chang, Joo Pyoung Choi and Won Cheol Lee (Soongsil University, Korea)

VI-5.2 Spectrum Coordination of Multi-RAT D2D for IoT Service
Do-Yun Kim and Young-June Choi (Ajou University, Korea)

VI-5.3 Wi-Fi and Super Wi-Fi Co-location for Exploiting Spectrum Heterogeneity
Kyubo Shin, Hyoil Kim and Se Young Chun (UNIST, Korea); Dong-Hoon Shin (AT&T Labs, USA)

VI-5.4 Distributed Scheduling for Coexistence of IoT Wireless Devices
Illsoo Sohn (Gacheon University, Korea); Sang Hyun Lee (Sejong University, Korea)

VI-5.5 Cognitive Radio Based Parallelized Relaying Scheme
Kwangyul Kim (Soongsil University, Korea); Chung Jin Lee (Korea Polytechnic University, Korea); Yoan Shin (Soongsil University, Korea); Junsu Kim (Korea Polytechnic University, Korea)

[Session VI-6] Advanced Wireless & Mobile Communication Systems and Infrastructure

Oct. 30, 11:10-12:50

Chair: Prof. Jangwon Lee (Yonsei University, Korea)

VI-6.1 A new design of transmitted reference UWB transceiver with non-ideal delay lines
Yongnu Jin, Taiping Cui, and Kyung Sup Kwak (Inha University, Korea)

VI-6.2 Synthesis Techniques of Narrow Beam-Width Directional Antenna Measurements for Millimeter-Wave Channel Characterization
Jinyi Liang, Juyul Lee and Myung-Don Kim (Electronics and Telecommunications Research Institute, Korea); Xuefeng Yin (Tongji University, P.R. China)

VI-6.3 Threshold Based Reporting for Improving Sensing Efficiency in Cognitive Radio Systems with Multiple Cognitive Users
Junaid Imtiaz and Dongwoo Kim (Hanyang University, Korea)

VI-6.4 Deployment Strategy Analysis for Underwater Cooperative Wireless Sensor Networks
Zafar Iqbal and Heung-No Lee (Gwangju Institute of Science and Technology, Korea)

VI-6.5 Blind Channel Estimation of MIMO-OFDM Systems in Satellite Communication
Mahdi Shirmohamadi and Mohammad-Ali Damavandi (Islamic Azad University South Tehran Branch, Iran)

ICTC 2015

International Conference on ICT Convergence 2015

Registration

- Author Registration Deadline: September 18, 2015
- Early Registration Deadline: September 30, 2015

Registration Policy

1. To be published in the ICTC 2015 Conference Proceedings, a minimum of one author from each accepted paper MUST register at the Regular registration fee (member or non-member) and the paper must be presented at the conference
2. "Member" rates apply to members of IEEE (Institute of Electrical and Electronics Engineers), IEICE(The Institute of Electronics, Information and Communication Engineers), KICS(Korea Institute of Communications and Information Science), and CIC(China Institute of Communications).
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5. Non-refundable author registration fees must be paid prior to the early registration due (September 18, 2015).
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Contact Information

If you have any questions, please contact Registration Secretariat of ICTC 2015 at ictc@kics.or.kr

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Travel Information

Hallasan National Park

Hallasan stands out at the center of South Korea's southernmost island, boasting exquisite landscapes due to its varied volcanic topography and vegetation distribution ranging vertically through the subtropical, temperate, frigid and alpine zones. The special nature of this area led to its being designated and managed as a national park in 1970, a UNESCO Biosphere Reserve in 2002, a World Natural Heritage Site in 2007. Muljangori Oreum registered as a Ramsar Wetland in 2008.

Jeju Olle

"Olle" [Ole] is the Jeju word for a narrow pathway that is connected from the street to the front gate of a house. Hence, "Olle" is a path that comes out from a secret room to an open space and a gateway to the world. If the road is connected, it is linked to the whole island and the rest of the world as well. It has the same sound as "Would you come?" in Korean, so Jeju's "Olle" sounds the same as 'Would you come to Jeju?'. The first trail route was opened to the public in September, 2007. Since then, the Jeju Olle exploration team has created a combined total of 200km of walking trails in Jeju island. Currently eleven trail routes have been opened to walkers and the trail exploration team is still working on new routes.

Udo (Cow Islet)

The island was named "Udo" or "Cow Island" as its contours look like a cow lying down on the ground. There are 8 scenic wonders of Udo: day and night(Judan-myeongwol and Yahang-eobeom), sky and earth (Cheonjin-gwansan and Jidu-cheongsa), front and back (Jeonpo-mangdo and Huhae-seokbyeok), and east and west (Dongan-gyeonggul and Seobin-baeksa). The movie "In October" and "The mermaid" were shot at Cow Island, capitalizing on its picturesque scene of a fishing village and a lush, peaceful grassy field. The white sand beach facing the indigo and turquoise sea of Jeju is very impressive.

Seongsan Ilchulbong (Sunrise Peak)

99 rocky peaks surround the crater like a fortress and the gentle southern slope connected to water is a lush grassland. On the grassland at the entrance of Sunrise Peak, you can enjoy horseback riding. Breathtaking scenic views while taking a rest in the middle of climbing up the peak such as Mount Halla, the deep blues of the ocean, the multi-colored coast line, and the picturesque neighboring villages will become unforgettable memories.

Travel Information

Seopjikoji

Jutting out at the eastern seashore of Jeju Island, Seopji-Koji is one of the most scenic views with the bright yellow canola and Seongsan Sunrise Peak as a backdrop. The pristine beauty of Jeju can be seen in Seopji-koji. Sinyang Beach, a meadow filled with canola flowers, peacefully grazing Jeju ponies, a rocky sea cliff, and a towering legendary large rock (Sunbawe) all combine to make nature s masterpiece. Unlike the other coastal areas of Jeju, it has red volcanic rock (songi) and strangely-shaped rocks that at low tide transform this area into a breath-taking stone exhibition gallery.

Manjang Cave

Manjang Cave, situated at Donggimnyeong-ri, Gujwa-eup, North Jeju, 30 kilometers east of Jeju City, was designated as Natural Monument No. 98 on March 28, 1970. The 7,416-meter long cave has been officially recognized as the longest lava tube in the world. The annual temperature inside the cave ranges from 11℃ to 21℃, thus facilitating a favorable environment throughout the year. The cave is also academically significant as rare species live in the cave. Created by spewing lava, "the lava turtle", "lava pillar", and "Wing-shaped Wall" look like the work of the gods. It is considered to be a world class tourist attraction.

Gimnyeong Maze Park

This park was opened to the public in 1997 after its development was begun in 1987. In the area of about 3300 square meters, there are 1232 Leylandii trees and two Gold Leylandii trees from England. The overall extended length of labyrinth is 932 m and the shortest course between entrance and exit is 190 m long. Manjang Cave Culture Center, located between Manjang Cave and Gimnyeoungsa Cave, is a part of Manjang Cave tourist complex which is currently being expanded. Three bridges totaling 46 m and an observatory give visitors ample opportunities for picture taking.

Mysterious Road (Dokkaebi Road)

On Mysterious Road (or Bugaboo Road), a parked car on a slight hill road rolls uphill instead of going downhill. This is a result of an optical illusion in which the lower part looks higher because of its surrounding environment.

Cheonjiyeon Waterfall

The waterfall falls from a precipice with thundering sounds, creating white water pillars. It has the name Cheonjiyon, meaning 'the heaven and the earth meet and create a pond'. At 22 m in height and 12 min width, the waterfall tumbles down to the pond to produce awe-inspiring scenery. The valley near the waterfall is home to Elaeocarpus sylvestrisvar, ellipticus, which is Natural Monument No. 163, Psilotum nudum, Castanopsis cuspidatavar. sieboldii, Xylosma congestum, Camellia and other subtropical trees. This place is also famous as home to the eel of Anguilla mauritiana, which is Natural Monument No. 27 and is active primarily at night.

Transportation to and from Hotel

1. Limousine Bus – No. 600 (bound for Seogwipo)

Route: Airport → The Hotel → Grace Hotel (Lotte City Hotel Jeju)
Bus Stop: Grace Hotel (Lotte City Hotel Jeju)
Travel Time: About 15 min.
Fare: KRW 1,300 (one way)

2. By Bus - Coach Bus No. 37

Bus Stop: Grace Hotel (Lotte City Hotel Jeju)
Travel Time: About 17 min. (5 stops)
Fare: KRW 950 (one way)

3. By Car

Route: Gonghang-ro → Doryeong-ro → Iljuseo-ro
Total Distance: 3.58km
Travel Time: About 12 min.

Route: Gonghang-ro → Doryeong-ro → Seongsan-ro 1-gil
Total Distance: 3.15km
Travel Time: About 10 min.

Route: Gonghang-ro → Shindae-ro → Yeonsam-ro → Doryeong-ro
Total Distance 3.15km
Travel Time: About 10 min.

Memo

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※ 직접 카드 정보 입력도 가능

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- 잠금, 홈, 꺼진 화면에서
  손가락을 밀어 올려
  삼성 페이 실행

3) 지문 인증
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  지문 인증
- 등록된 지문만으로 결제하여
  더 안전해진 카드 결제

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※ 제휴한 카드사의 개인 신용카드와 체크카드로 사용 가능합니다 (2015년 8월 기준, 추후 변경될 수 있음. 하나카드는 추후 지원 예정)

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