IET International Conference on Frontiers of Communications, Networks and Applications (ICFCNA 2014)

3-5 November 2014, Sunway Resort Hotel & Spa, Malaysia

The IET International Conference on Frontiers of Communications, Networks and Applications (ICFCNA 2014) will be held in Kuala Lumpur, Malaysia. The aim of the conference is to bring together researchers from academia as well as practitioners from industry to meet and exchange ideas on recent research work in the areas of communication systems, networks and applications. The programme will feature industry forums and two special tracks. Full details of submission procedures are available at http://www.icfcna.org. Accepted paper will be published in IET conference proceeding (ISBN: 978-1-84919-832-5) which will be included in IET Digital Library, IEEE/IET Electronic Library (IEL), IEEE Xplore®, Inspec and will be considered for EI Compendex and ISI indexing. Extended version of high quality, selected papers will be invited to be published in IET Network. Some best paper awards will also be awarded. Prospective authors are invited to submit original technical papers for oral presentations on the following topics (but not limited to):

PHY, MAC and Cross Layer Design
- PHY/MAC cognitive and SDR techniques
- Interference channel modelling and characterization
- Modulation, coding and diversity
- MIMO and AAS
- Signal processing for wireless communications
- Information theory for wireless communications
- Cross layer architecture and protocol design
- Multiple access techniques
- Radio resource management, power control, energy conservation techniques
- PHY/MAC cooperative and collaborative techniques

Networks
- Wired networks
- Optical networks
- Wireless networks (e.g. mesh, relay, ad-hoc and sensor networks, B3G/4G WAN/WLAN/WPAN/WBAN)
- Heterogeneous, cooperative and coexistence
- Network architecture and protocol design
- Mobility, location and handover management
- Broadcast, multicast and streaming
- QoS and traffic management
- Routing
- Capacity, coverage, network planning
- Networks for rural areas
- Green architecture, systems and protocols

Services and Applications
- Emerging wired/wireless/mobile applications
- Context and location aware services and applications
- Content distribution in wide area and home area networks
- Telemedicine and e-health services and applications
- Network security and privacy
- Intelligent transportation systems
- Service oriented architectures, middleware
- P2P services and applications
- SIP, multimedia, QoS supports
- Dynamic and autonomous services, artificial intelligence
- Regulations, standards and spectrum
- Testbed, prototypes implementations
- Personalization, service discovery, profiling
- Techno-economic and market analysis for wired/wireless/mobile ad hoc networks

Extended version of high quality, selected papers will be invited to be published in IET Network

Best Paper Award and Lucky Draw Prizes

A *Best Paper Award* will be conferred to the delegate(s) of a paper presented at the conference. Delegates may win incredible lucky draw prizes, such as IoT development platform, mobile phones and tablets, sponsored by Industry such as Intel and Samsung.

ICFCNA delegates and participants are given free entrance to the following events.

Keynotes

Renowned scientists from the academic and industry are invited to provide their insights on frontier technology and trend in wireless communications, as well as to share their experience in projects involving real-world implementations of ICT.

Industry Forum

Leaders from the industry will take this opportunity to provide the latest insight on technology development and future trend, as well as to share their experience in the industry particularly in the areas of mobility, embedded systems, Internet of things, security and Big Data. Representatives from the industry will also take this opportunity to explore research opportunities with delegates and participants, making it a good platform to bridge the gap between academic and industry.

Smart City Workshop

Co-organized by: MDeC

Support by: Intel, IBM, Recogine Technology, Sunway and DBKL

Smart city is the natural evolution for the ever-growing cities around the globe to provide a sustainable solution in the face of rapid urbanization. Various technologies are critical to the success of a smart city, including sensors, actuators, networks, etc. This workshop serves as a melting pot of ideas and solutions to most issues associate with smart city.

ICFCNA prides itself with its partnership with the following academic and industrial organizations:

Innovation Workshops

Renowned innovators will gather in these workshops to bring up new and innovative ideas. Come and meet Mr. Robest Yong and Dr. Yeoh Teong San for a discussion during the workshop or a casual chat over a tea break to discover how to generate innovative ideas, and how to bring these ideas to life. Mr. Robest Yong will share with us his experiences and methods in generating various money-making products. Dr. Yeoh Teong San will provide us one of the most important principles in innovation – TRIZ.

Keynote 1: Dynamic Spectrum Access - The Enabler for Smart City

Speaker: Dr. Oh Ser Wah, **MBA** (Head of TV White Spaces Department, Deputy Director of Strategic Planning Office, Advisor of Smart Grid Programme and Co-Director of SPICE.sg (I2R-SP Joint Lab) Institute for Infocomm Research :: Agency for Science, Technology and Research (A*STAR))

Abstract: Due to urbanization, many countries are looking at Smart City for better utilization of resources. To realize Smart City where residents and other stakeholders have access to real-time information, a comprehensive communication infrastructure is required. On the contrary, most of the spectrums have been allocated for various services which resulted in the well-known "spectrum crunch" issue. To move ahead with vast increase in demand for wireless communications, spectrum sharing is required. Dynamic Spectrum Access (DSA) is a promising area to share spectrum in an efficient manner. The speaker will describe various sharing options and give an overview of the latest development in this area. A specific example of DSA, namely TV White Space (TVWS) will also be introduced. A few examples of application of TVWS in Smart City will also be shared.

Short Biography: Ser Wah OH obtained his B.Eng. from the University of Malaya (UM), Malaysia and Ph.D. and MBA degrees from Nanyang Technological University (NTU), Singapore. He currently holds multiple appointments at the Institute for Infocomm Research (I2R) which includes Head of TV White Spaces Department, Deputy Director of Strategic Planning Office, Advisor of Smart Grid Programme and Co-Director of I2R-Singapore Power Joint Lab. Ser Wah is also being appointed as a member of the Ministry of Communication and Information's Infocomm Media Masterplan 2025 working committee on Infrastructure. He is also the Co-Founder of the Singapore White Spaces Pilot Group and Co-Chairman of Infocomm Development Authority of Singapore (IDA) task force on TV White Spaces. He led a team to contribute to the Federal Communications Commission (FCC) TV White Space trial in the USA in 2008, which helped FCC to open up TV White Space for unlicensed communications. Together with partners, the TV White Space solution designed by I2R has been deployed in several locations in Singapore and the region including the world's largest TVWS network in the Philippines. Prior to I2R, he was a Technical Manager at STMicroelectronics in charge of teams in Singapore and Beijing R&D Centers for 3G WCDMA and TD-SCDMA development. Ser Wah is also a recipient of the 2014 ASEAN Outstanding Engineering Achievement Award, 2014 & 2009 Institution of Engineers Singapore Prestigious Engineering Achievement Award, the 2013 & 2012 WUN CogCom Best Paper Award in Practical Implementations and Trials, 2010 Ernst & Young Cash Prize Award as the Top MBA Graduate, and IEEE ICT 2001 Paper Award.

Keynote 2: Impact of 5G developments on backhaul networks in rural and remote areas

Speaker: Christian Niephaus (Fraunhofer Institute for Open Communication Systems)

Abstract: The 5G networks currently being defined and designed will have to provide significantly more capacity per user than 4G networks in order to cope with emerging application and services. A great deal of effort is made to investigate novel technologies and mechanisms for the access networks, such as mmWave, ultra dense deployments or massive MiMO, in order to address these bandwidth demands. However, the implications on the backhaul segment of the network, which will also drastically increase in the future, are often silently ignored. Already in urban areas we may experience difficulties to provide the 5G cells with sufficient capacity. In rural and remote regions it will become a tremendous challenge, hence the digital divide might persist. Fraunhofer's intelligent self-configuring Wireless Backhaul (WiBACK) network, which will be presented by the speaker, addresses those problems. Moreover, example of successful deployments in in Africa and South-America will be shown.

Short Biography: Christian Niephaus received his B.Sc. and M.Sc. in Computer Science from the University of Applied Sciences Bonn-Rhein-Sieg in 2006 and 2008, respectively. During his Master thesis he dealt with efficiency of MAC protocols for IEEE 802.11 networks. Since 2007 he is with the Fraunhofer Institute for Open Communication Systems (FOKUS) where he participates in different EU FP6 and FP7 projects such as NetQOS, CARMEN, BATS as well as national research projects as contributor and task leader. He was also active in IEEE 802 standardization efforts as a contributor to the IEEE 802.21 Working Group. His current research interests are emerging 5G networks and satellite-terrestrial network convergence with a strong focus on the special requirements of rural and remote areas. In this regard he (co-)authored a considerable number of papers in relevant international conferences, journals and book-chapters.

Industrial Forum: Digital Planet–The Global Revolution Driven by Telecommunications

The aim of the event is to provide a forum that brings together successful and prominent industrial experts and key players to meet and exchange experiences and insights on key areas of telecommunications industry which helps to bridge the gap between industry's future direction and research focus. The forum will cover selected hot topics in this fast-growing field such as: (1) telecommunications businesses and markets; (2) regulation and standardization of wireless technologies and networks; (3) the current form and future prospect of ICT R&D; (4) 4G, 5G and beyond; (5) mobile hardware: are hardware manufacturers keeping up the pace of our thirst in seeking faster broadband? All participants are invited to attend and meet with the experts.

WildPackets	**NextGen Wireless Analysis** **Abstract:** Traditional wireless LAN analysis relied on USB adapter as receiver to capture wireless packets for analysis. Unfortunately, USB is unable to meet the transmission rates of upcoming 802.11ac. WildPacket is proud to introduce its next generation of wireless solution that is capable of performing the following capabilities: Unified Network Analysis, Decrypting on the 'fly', Wireless Aggregation, Wireless Roaming Analysis, Ability to Analyze Remote Location, VoIP over WiFi etc.
SAMSUNG	**Samsung Smart Signage solution** **Abstract:** This talk describes usage models that can help you implement a flexible and efficient digital signage solution to realize competitive advantages in your own business. It also describes the ecosystem, opportunity and ways of extracting business values.
University of Glasgow	**Internet of Things (IoT): Security and Standardization** **Abstract:** The Internet of Things (IoT) is the next wave of innovation that promises to improve and optimize our daily life based on intelligent sensors and smart objects working together. The objective of this talk is to share the speaker's experience in developing intelligent lighting control solutions for building services based on IoT technology. Security issues will be discussed in this talk, and the efforts in standardizing security solutions in the Internet Engineering Task Force (IETF) in order to enable IoT devices to securely communicate with each other in an interoperable manner will be presented.

Smart City Workshop: Hand in hand, we can, the Smart City is on its way

Proudly co-organized and moderated by MSC Malaysia.

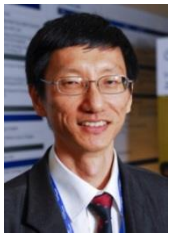
	Smart City – Where are We?
intel	**The Internet Of Things - The Next Evolution Of Computing** **Abstract:** Will provide an overview of computing evolution, leading to internet of things and Intel's focus across different market segments. Introduce Intel solutions for IoT, some examples of industrial engagement and highlight some areas for smart cities.
IBM	**IBM Smarter Cities initiative: Using big data for Smart City transformation** **Abstract:** IBM's Smarter Cities Initiative aims to take the ever growing amount of real-time data. This data comes from everywhere: from sensors used to gather climate information, posts to social media sites, digital pictures and videos, purchase transaction records, and cell phone GPS signals to name a few. More information is on its way.
RECOGINE TECHNOLOGY	**Intelligent Transportation System – the crucial link for Smart City** **Abstract:** Road transportation is vital for sustaining Kuala Lumpur economy, and essential for the movement of people and goods. Intelligent Transportation System, developed by Recogine Technology Sdn Bhd, has been deployed in major highways and cities. The presenter will share with us this unique solution, and provide us an insight of how Intelligent Transport System accelerates the development of Smart City in Malaysia.
SUNWAY	**Sunway inMotion** **Abstract**: Sunway has been around for 40 years and it prides itself on giving life to transformational initiatives such as the creation of Sunway Resort City, right to the vision for Sunway Iskandar. Sunway being in motion, means innovating instead of stagnating, leading with passion, and championing our desired change. Hence, the objective of the proposed idea, is to introduce the concept of "Sunway inMotion", where the community positively identify with the brand Sunway and what its vision stands for, and thus are actively engaged with Sunway through its unique lifestyle signatures manifested through its range of products and value added services offered.

Innovation Talk 1: The D.U.M.B.S Approach to invention
Speaker: Robest Yong

Abstract: Creating invention is no longer a territory just to those people who possess high academic qualification. History has shown that great inventors were school or university dropouts, but capable of changing the world with their believes and passionate to invent. However, statistical report has also indicated only 2-3 percent registered patents succeeded to the market. What were the reasons and how to ensure your next invention contribute to this 2-3 percent? Let's learn the DUMBS way to secure your successful invention.

Short Biography: Mr. Robest Yong is an award winning innopreneur. He has invented and marketed quite a number of products, besides receiving a host of international awards and recognition. His first successful invention was the "Polyclone Instant Rubber Stamp Machine" back in 1994. Robest has been appointed as the Innovation Ambassador by Agensi Inovasi Malaysia (AIM), served as judge in almost all major innovation competitions including IDEAS, ITEX, MTE, PECIPTA, while contributing as regular speaker in events organized by schools, associations, academic institutions, universities, international corporation as well as government agencies.

Innovation Talk 2: TRIZ & Innovation in Industries
Speaker: Dr. Yeoh Teong San



Abstract: Theory of Inventive Problem Solving (TRIZ) is a structured methodology for problem identification, root cause and breakthrough idea generation. It is a recognized international science of creativity, based on the laws of physics and innovative patents distilled to numerous innovative tools. It is a toolbox which provides engineers with methodologies to create breakthrough ideas. Case studies will showcase the application of TRIZ tools in accelerating the problem solving process and generation of innovative solutions in industries.

Short Biography: Dr. Yeoh Teong San worked in Intel Malaysia for more than 25 years as a Principal Engineer. He holds a PhD in Applied Physics from Universiti Sains Malaysia. He is currently actively involved in TRIZ and other innovation initiatives. He has conducted many Structured Problem Solving and Systematic Innovation facilitation sessions and worked with engineers across different countries. He has published articles in journals and conference proceedings and has also authored a book on Theory of Inventive Problem Solving (TRIZ). Dr. Yeoh is one of the founders and president of the Malaysia TRIZ Innovation Association (MyTRIZ).

Special Track 1: Information Security

Co-chairs: Bok-Min Goi (Universiti Tunku Abdul Rahman), Geong Sen Poh (University Malaysia of Computer Science and Engineering)

Information security is one of the main research areas in IT since it has become increasingly critical to protect information and communications from security threats due to the mobile and networked nature of today societies. Successful exploitations on computer systems may result in disruptions of services and economic loss. New security mechanisms are devised to address security concerns while at the same time new attacks are created to circumvent these security measures. In this track our aim is to solicit submissions of original and unpublished papers on research and development in information security that provide new mechanisms, insights into potential weaknesses of existing mechanisms, case studies, industrial experiences and new paradigms, including the following topics, but not limited to:

• Applied Cryptography • Cryptanalysis • Cloud Security • Wireless Security	• Access Control • Network Security • Cyber Security • Privacy and anonymity	• Multimedia Security • Security Protocols • Security in Social Networks • Usable Security	• Computer Security • Biometrics • Provable Security • Trust Management

Special Track 2: Cognitive Radio and Software Defined Radio: Technical, Application, Environmental, and Regulatory Aspects

Co-chairs: Kok-Lim Alvin Yau (Sunway University), Qiang Ni (Lancaster University), Kim Chuan Lim (Universiti Teknikal Malaysia), Heng Siong Lim (Multimedia University)

The rising number and capacity requirements of radio systems has increased the demand for frequency spectrum. Cognitive radio is the next generation wireless communication systems that offers a revolutionary solution to this problem by proposing opportunistic access to underutilized licensed spectrum owned by the licensed users. Cognitive radio architecture was first proposed by Joseph Mitola III in 1998, and it addresses the organization of the radio domain knowledge into data structures which can be processed in real-time through integrating machine learning and natural language processing technologies into software radio. The features of the architecture are derived from cognitive radio use cases. These include inferring user communications context, shaping access-network demand, and realizing a protocol for real-time radio spectrum rental among others. This new concept allows a radio system to be power efficient and applicable to large scale networks, and most importantly to operate in harmony with licensed users and existing legacy radio systems. For commercialization purpose, regulatory rules, compliance tests, market mechanisms and value chains need to be defined to assure the security and protection of the legacy systems. This track provides a platform for researchers to discuss a wide range of topics relevant to the cognitive radio technology, including technical, regulatory, techno-economic and other aspects. This special track solicits original and unpublished submissions on relevant topics, including but not limited, to:

Technical: • Cross-layer algorithms • PHY techniques (e.g. MIMO and modulation) • MAC techniques (e.g. spectrum sensing, dynamic spectrum access, Interference mitigation and spectrum handoff, resource allocation) • Network-layer techniques (e.g. routing algorithms and protocols)	• Security and robustness • Information theory and performance limits • Learning, decision making and self-configuration techniques (e.g. applied artificial intelligence and bio-inspired intelligence) • Hardware (e.g. prototypes, test beds, demonstrations and real-life deployments) • QoS architecture and provisioning	Application • Novel applications • Cognitive radio applied to green communications • Cognitive radio applied to green environment such as smart homes and vehicles • Cognitive radio applied to emergency and public safety systems	Application • Energy consumption of CR technologies such as channel sensing and switches • Energy efficiency metrics and measurements Regulatory: • Standardization • Regulatory structures • White spaces (e.g. television spectrum and cellular spectrum)

Special Track 3: Communications, Networks and Applications for Smart City

Co-chairs: Sian Lun Lau (Sunway University), Maclen Wong Quan Lin (Sunway Group Information Technology)

***** Best Paper award will be presented by MDeC *****

More than half of the world's population now lives in an urban environment. This proportion will continue to rise, mostly attributed to the migration from rural areas to urban areas. This trend of urbanization has placed considerable stress on infrastructure, as well as residential and commercial properties. Smart city aims to improve the quality of living in urban areas through smart sensors, devices anvd services widely deployed in a distributed manner to monitor and adapt to the environment in real time. Services in a smart city collect and process information, store sensing outcomes, communicate among themselves, as well as make real-time and intelligent decisions. This special track aims to gather academics, researchers and practitioners from around the world to meet and share ideas on recent developments, current research challenges and future directions in the communications and networking, as well as ICT systems and applications that contribute to realize a smart city of the future. This special track solicits original and unpublished submissions on relevant topics, including but not limited, to:

• Research challenges and deployment issues associated with smart infrastructure in urban areas • Communications and networking infrastructure for smart city • Communications and networking infrastructure for smart energy system • Communications and networking infrastructure for intelligent transportation system • IoT and sensor networks for pervasive urban sensing	• Security and privacy issues • Clouds technologies for smart city • ICT systems for smart city • Big data delivery for smart city applications • Participatory sensing in smart city