

Commission C

Session	Title	Convener names & e-mails	Number of slots
C01	Resource Management in Future Wireless Communications	Haijun Zhang, Xinchang Zhang zhanghaijun@ustb.edu.cn	5-6
<p>Driven by the development of mobile Internet and smart phones, data traffic grows exponentially in current mobile communication systems. The opportunities and challenges of the fifth-generation (5G) and B5G rapidly gain great attention from academics, industries, and governments. Resource Management is a promising technique to meet the requirements of explosive data traffic in 5G、 B5G mobile communications. This session will bring together academic and industrial researchers to identify and discuss technical challenges and recent results related to the resource management techniques for 5G/B5G mobile networks.</p>			

Session	Title	Convener names & e-mails	Number of slots
C02	Application of Machine Learning in Wireless Communications	Ruisi He, Georgios Ropokis, Ozlem Kilic, ruisi.he@bjtu.edu.cn, georgios.ropokis@centralesupelec.fr, okilic@utk.edu	5-6
<p>Machine learning was introduced as a technique for artificial intelligence. It explores the study and construction of algorithms that can learn from and make predictions on data. In recent years, wireless communications of 4G and 5G have been seen as big, evolving distributed databases full of context and information. Machine learning techniques have been thus used extensively for a wide range of tasks including clustering, classification, sensing, regression, and density estimation in a variety of application areas such as cognitive radio, compressed sensing, traffic analysis, routing, big data, cloud communications, green communications, spectrum sensing, wireless access techniques, and radio channel modeling. The algorithms and techniques used come from many diverse fields including statistics, mathematics, neuroscience, and computer science. The focus of this session is to showcase a unified vision for the application of machine learning in wireless communications, including all technologies above and other relevant aspects.</p>			

Session	Title	Convener names & e-mails	Number of slots
C03	5G Wireless Communications and IoT	Ruisi He, Wei Wang, ruisi.he@bjtu.edu.cn, wei.wang@chd.edu.cn	5-6
<p>The fifth generation (5G) wireless communication networks have been expected to support communications with high mobility, e.g., with a speed up to 500 km/h, and it will have wide applications in the high mobility scenarios, such as high speed railways, vehicular ad hoc networks, and unmanned aerial vehicles (UAVs) communications. The focus of this session is to showcase a unified vision for the 5G wireless communications with high mobility, with an emphasis on wireless communications and other relevant aspects. The proposed session aims to bring together researchers, industry practitioners, and individuals working on the related areas to share their new ideas, latest findings, and state-of-the-art results.</p>			

Session	Title	Convener names & e-mails	Number of slots
C04	5G and Internet of Things : deployments and trials	Fortunato Santucci, Marco Pratesi, fortunato.santucci@univaq.it, Marco.Pratesi@univaq.it	5-6

Mobile communications sector is one of the strongest growing markets in the world. This growth is not expected to slow down with the proliferation of laptops, tablets, wearables and the variety of applications being supported by 5G communications and the Internet of Things (IoT). This session will be dedicated to 5G deployments and trials that are expected in the coming months. As illustration, this session could also focus on health monitoring, massive IoT, intelligent transportation and systems including trials and subsequent developments.

Session	Title	Convener names & e-mails	Number of slots
C05	Optimization of Wireless Power Transfer	Guillaume Villemaud, Florin Hutu, Satoshi Tsukamoto guillaume.villemaud@insa-lyon.fr, florin-doru.hutu@insa-lyon.fr, tsukamoto@comm.ee.tut.ac.jp	4

Transferring the electrical power wirelessly is an old research topic, but the conjuncted progresses of source optimization and ultra low-power transceivers now enhance the potential of applying this principle into the real world. In the scope of wireless sensor networks (WSN) or Internet of Things (IoT), an optimized Wireless Power Transfer (WPT) could now be foreseen. This session will bring together academic and industrial researchers to identify and discuss technical challenges and recent results related to the optimization of WPT, either on specific parts or globally, but also pointing out realistic usage of this technology.

Session	Title	Convener names & e-mails	Number of slots
C06	Internet of Things for licensed and unlicensed spectrum	Christophe Moy, Sumit Darak christophe.moy@univ-rennes1.fr, sumit@iiitd.ac.in	5-6
<p>Internet of Things (IoT) is expected to have a great impact on every aspects of life in the 21st century, at both social and industrial levels. A revolution is expected thanks to IoT in all domains, such as health, smart city, smart building, manufacturing, smart grid and energy in general, transport and automotive, logistics, government, etc. IoT is at its very beginning and research can still bring new solutions for improvement of current emerging proposals and for future innovative low power wide area networks (LPWAN). All aspects are still open: wireless modulation, 5G-IoT, LPWAN, massive traffic analysis, spectrum scarcity mitigation, cognitive radio, green IoT networks, objects design, ultra-low power electronics, sensors design, inter-operability, multi-standard gateways, spectrum sensing, non-uniform sampling, operated versus non operated networks, safety, privacy, machine learning, big data, data mining, etc. The mathematical algorithms and techniques used in IoT in particular, cover many diverse fields including statistics, optimization and machine learning that can be used for both computer science and electronics. We can also notice that currently, two parallel solutions are emerging, in licensed and unlicensed bands, it is still too early to say if one will win, or if they will be complementary and share the IoT market. The very different way they tackle IoT networks gives the opportunity to multiply studies and disruptive ideas. All these questions are open to dicussion in this session, with a focus on all relevant theoretic and technology matters.</p>			

Session	Title	Convener names & e-mails	Number of slots
C07	Multiple Acess in communications networks	Haïfa Fares, Arman Farhang Haifa.fares@centralesupelec.fr, arman.farhang@mu.ie	6
<p>Popularity of video streaming, online gaming, App downloads and software updates, together with emergence of new technologies like internet of things, connected cars, and smart cities are driving new patterns in the communication networks of the future. This leads to requirements such as very high data rates, massive connectivity, and low latency in the fifth generation communication systems (5G). Thus, investigation of new multiple access techniques is of a paramount importance towards meeting the aforementioned requirements. Orthogonal or Non Orthogonal Multiple Access (OMA and NOMA) can be proposed as promising access method for 5G to avert radio resource shortage due to a huge increase of the number of connected devices expected within the next few years. This session intends to cover all the associated area of multiple access (OMA, NOMA, OFDMA, Successive Interference Cancellation,).</p>			

Session	Title	Convener names & e-mails	Number of slots
C08	Progress of Wake-Up radio systems	Guillaume Villemaud, Florin Hutu guillaume.villemaud@insa-lyon.fr, florin-doru.hutu@insa-lyon.fr	6
<p>Using wake-up radios is a well-known way of reducing the global power consumption of sporadic wireless networks. Numerous solutions exist, active or passive, with very various trade offs between the operating range, the possibility of identification, and the actual power consumption. This session will be dedicated to present and discuss any new advance in the design or application of Wake-up radios.</p>			

Session	Title	Convener names & e-mails	Number of slots
C09	Radar and Communications Co-Design	Vijay Mishra, Anthony F. Martone, Amir I. Zaghoul. vizziee@gmail.com, anthony.f.martone.civ@mail.mil, amir.i.zaghoul.civ@mail.mil	5-6
<p>Collaborative design of communications and radar systems is defining a new era of efficiently utilizing a limited radio-frequency spectrum. While spectral co-existence focuses on devising strategies to mitigate the interference adaptively for either communication system or radar under the assumption that the two systems coexist as separate systems, spectral co-design involves development of new joint remote sensing and communications where a single unit is employed for both functions while also utilizing the opportunistic access to the spectrum. Such a radar-communications co-design has advantages of low-cost, compact size, less power consumption, spectrum sharing, improved performance, and safety due to enhanced information sharing. This special session will highlight the latest advances in co-design including, but not limited to, new software-defined systems, prototypes, signal processing/communications algorithms, machine/deep learning-aided designs, channel sharing topologies, and cognitive sensing.</p>			

Session	Title	Convener names & e-mails	Number of slots
C10	Multi-antenna technologies and massive MIMO	Amor Nafkha, Matthieu Crussière Amor.nafkha@centralesupelec.fr Matthieu.cruissiere@insa-rennes.fr	5-6
<p>This session is open to papers addressing any aspect of MIMO technology including, but not limited to, its use for increased data rate, improved reliability, enhanced signal-to-interference ratio and improved energy or spectral efficiency. Application may be to existing, emerging or entirely new services. Papers may treat any area of MIMO theory and practice including fundamental principles, channel modelling and measurements, theoretical and practical limitations, signal processing algorithms, complexity and economic considerations and hardware implementations.</p>			

Session	Title	Convener names & e-mails	Number of slots
C11	Visible Light Communications	Vimal Bhatia, Rangeet Mitra vbhatia@iiti.ac.in, rangeet.mitra@iiits.in	4-6
<p>Visible light communications (VLC) is a viable supplement to existing radio frequency (RF) communications, since shifting communication towards the nm-wave range results in expansion of the available bandwidth to meet the spectrum and low power demands for the proposed 5G and beyond systems. In VLC, the light emitting diode (LED)- lamps, generally used as luminaries, additionally serve as optical-transmitters, and photodiode-arrays are used as optical receivers in a typical optical attocell. The intensity modulation of LED by users' signals is done at a speed imperceptible to human eye, thereby achieving the dual goal of illumination and signal transmission at lower power as compared to RF equipment. VLC is a core component of Li-Fi systems, which has been proposed for applications like Internet of Things (IoT), 5G systems, underwater communications, vehicle-to-vehicle communication and many others. In this talk, we will go over the basics, importance, issues, and solutions for VLC, and also explore ways to increase the throughput with some future directions.</p>			

Session	Title	Convener names & e-mails	Number of slots
C12	Global Navigation Satellite System	Sanat K Biswas, Salil Goel, Ediz Cetin sanat@iiitd.ac.in, sgoel@iitk.ac.in, ediz.cetin@mq.edu.au	8-10
<p>The advent of the Global Navigation Satellite System (GNSS) technologies, starting with the Global Positioning System (GPS), has brought significant technological innovations that were initially limited to positioning, navigation and timing (PNT) based systems. These space-based infrastructures have become crucial in applications involving transportation, navigation and integrated mapping systems, power distribution, finance and telecommunication sectors. Apart from PNT based systems, GNSS is being used in a plethora of applications such as weather and climate change studies, monitoring changes in water resources and for other remote sensing applications such as GNSS-Reflectometry (GNSS-R). While there is a wide range of possibilities of GNSS applications, these systems are vulnerable to intentional and unintentional radio frequency interference and spoofing. Hence, there is a strong need to develop technologies to detect, geo-locate and mitigate these interferences, making GNSS, which is now a critical infrastructure itself, resilient to these threats. This session aims to discuss recent developments in PNT applications of GNSS, GNSS-R, and interference and spoofer detection, geo-location and mitigation.</p>			

Session	Title	Convener names & e-mails	Number of slots
C13	Open session	Yves Louet, Ruisi He, Haijung Zhang yves.louet@centralesupelec.fr, ruisi.he@bjtu.edu.cn, haijunzhang@ieee.org	8
<p>This session intends to cover all technical topics and applications that have not been covered by the suggested special sessions and related to radio-communications.</p>			

Session	Title	Convener names & e-mails	Number of slots
C14	Age of Information in Wireless Networks and its Applications	Alberto Tarable, Francisco J. Escribano alberto.tarable@ieiit.cnr.it francisco.escribano@uah.es	5-6
<p>Age of Information (AoI) was introduced in 2011 and it rapidly gained interest as a metric to evaluate the freshness of information, alongside some more traditional parameters such as delay and latency. Since the original work, which dealt with a source transmitting periodic updates about its status through a simple queuing model, scenarios in which AoI finds application have multiplied. To name a few, source and channel encoding, caching, scheduling, optimization of vehicular networks, and so forth.</p> <p>The session aims at collecting advanced contributions on AoI in those contexts and scenarios that are particularly relevant for current and next-generation communication systems, i.e., 5G and beyond-5G: for example, Internet of Things, machine-type communications, UAV-assisted wireless networks, V2X communication networks, millimeter and sub-millimeter wave communications, smart environments, or enabling IC technologies for Industry 4.0.</p>			

Session	Title	Convener names & e-mails	Number of slots
C15	High efficiency communications	Yves Louet, Haïfa Fares Yves.Louet@centralesupelec.fr Haifa.fares@centralesupelec.fr	4
<p>ICT (Information and Communication Technologies including base stations, data centers, user equipment's, etc.) field is responsible of 6 to 10% of the worldwide electrical consumption what corresponds to 4% of the greenhouse gases emissions. With an early growth of 7% especially with the coming 5G and the expected increase of billions of connected "things", it is urgent to reduce this footprint by finding new ways of transmitting, processing and saving data. That is to say spectral efficiency (ie transmit the maximum data in a given bandwidth) has to be joined with the objectives to increasing the energy efficiency of the links. This session intends to cover waveforms with high energy efficiencies (CPM, FSK, SQPSK, ...) and the associated context (Internet Of Things, telemetry, ...) under the umbrella of Signal Processing and radio communications.</p>			