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Greetings from the New President

Shigeo Urushidani

President, IEICE Communications Society

Deputy Director General/Professor, National Institute of Informatics



It is my great honor to serve as President of IEICE Communications Society (IEICE-CS), which has fostered advanced communication and related technologies for a smarter society. First, I would like to express my gratitude to all the researchers and engineers in academia and industry for their hard work and contributions to IEICE-CS. I will do my best to highlight the significance of activities in IEICE-CS to meet its members' expectations.

IEICE-CS has over 11,000 members from more than 50 countries and is very active in both publications and conferences. It has three peer-reviewed monthly journals: two Transactions on Communications, for papers in English and Japanese, and Communications Express, for letters in English. About half of the accepted journal papers written in English are from outside of Japan. It also has a quarterly global newsletter (this one) and a magazine in Japanese. As for conferences, IEICE-CS supports more than 20 international conferences in cooperation with sister societies overseas and holds many domestic conferences with 21 regular and 7 ad-hoc technical committees (TCs). The TC conferences highlight a wide range of research, and our members can present their ideas without peer-review, exchange technical information, and enjoy academic discussions.

The greatest strength of IEICE-CS is the involvement of industry as well as academia in the above-mentioned activities. While the activities continue to be productive, industry recently expects even greater value from IEICE-CS to survive the rapidly-changing environment surrounding information and communication technology (ICT) business. Quite simply, IEICE-CS should be more involved in collaborations with a wider range of industry fields and be more sensitive to global trends of emerging applications and changes in the industrial environment. My thoughts are as follows.

As ICT platforms are now a fundamental part of our society, many industrial fields, including automobiles, robotics, and medicine, are keen to deploy advanced ICT platforms in order to enhance and differentiate their business. The movement toward the Internet of things (IoT) emphasizes this trend, and various upper-layer platforms over communication networks are being built. Artificial intelligence (AI)-based platforms, which gather and analyze big data from objects and send feedback to them through networks, are one such platform. We therefore need to broadly understand requirements from a wide range of industrial fields in

order to develop more compelling and useful advanced technologies. IEICE-CS should provide convenient grounds to spread knowledge regarding the uses of ICT in many business fields and provide opportunities to further relationships with various people.

ICT equipment, including communication systems, has been largely influenced by the over-the-top (OTT) operating global-scale services. The total amount of their investments has been rapidly increasing and will soon exceed that of telecom carriers. This trend has strongly influenced development strategies of system vendors. They have been required to meet unique specifications different from international standardizations. Unique but open architectures have become more important to achieve economically competitive platforms. This trend might give researchers higher chances of reconsidering desirable system, network, and platform architectures that are different from those of dominant system vendors. IEICE-CS should encourage its members to create more futuristic architectures for potential emerging services.

Although increasing global citations in our journal papers is very important, the published content should be more influential to industry. I believe that highly valuable papers will lead to collaboration between academia and industry and increase the industry's investments in academia. These collaborations are also beneficial to students as they may discover business opportunities and challenges. IEICE-CS has also published many technical papers, several thousand per year, presented in the TC conferences. These papers include early-stage ideas and technologies that would be valuable to industry as well as academia. IEICE-CS started to fully digitalize these papers this April, and all of the papers became accessible one month after their publication date with fixed license fees. I hope that this digitalization will increase the value of the TC conferences.

IEICE-CS has also played a role in educating young people, including students, in ICT fields. When they attend the TC conferences, many senior researchers and engineers give warm advice and encouragement to the students. IEICE-CS would like to value this productive relationship so that students gain inspiration from the advice and are motivated to produce innovative technologies for the growth of the ICT industry.

I would like to conclude this greeting message by asking all of you for your kind support and contributions to IEICE-CS activities.

Considering EMI Control as Technology

Takashi Harada
 Tokin EMC Engineering Co., Ltd.



1. Introduction

Have you ever heard “EMI control”? Electronic devices, such as computers, smart phones and robots, generate electromagnetic noises. These noises may cause interference with other devices and systems. They are called EMI (Electromagnetic Interference) and, therefore, their emission levels must be controlled below the allowable limits specified by government organizations or international committees such as FCC, CISPR.

I have been involved in the issue of EMI control as a researcher of an electronics company. To understand the noise which is unintentionally occurring phenomenon, we have to fully make use of electromagnetism and circuit theory. I think, however, opinions and tips obtained from papers and free discussions with colleagues in an academic society are even more important. This article briefly describes the contribution of activities in a society to my research.

2. From EMI Debugging to EMI Design

The EMI regulations for commercial electronic devices began to be strengthened in the mid-1980s. The EMI control, at that time, was mainly performed by “a rule of thumb” of experienced technicians. In 1990s, however, along with the progress of high density packaging and high frequency in digital devices, EMI control became increasingly difficult, and establishment of the theoretical control technologies was required.

The EMI control at this time was often performed in the EMI test which is a step of confirming compliance of products with the EMI specifications. Since this step is generally carried out in the final stage of a product development process, only retrofitting control can be applicable, for example, enhancement of housing shield and adding filters. This operation is also called “EMI

debugging”. It has the same meaning as reworking process in the software development. It is not a fundamental solution to this problem unless designing printed circuit board (PCB) and device selection, since the main sources of noises are traces on a PCB and ICs. As a solution to that proposition, we have developed EMI suppression support tool for PCB (See Fig.1) [1]. This tool was commercialized in 2001 and is now used by many manufacturers all over the world. It incorporates a function of checking the board traces and a time consuming simulation from EMI point of view. In developing this tool, I gained expertise and tips from activities in academic society. Let me introduce a couple of them here.

3. Tips obtained from Papers

If you are a researcher, several papers will come to you instantly when you are asked about ones those are strongly influenced to your research. I have such papers as well. One of them was when I manufactured two types of four-layer PCB sample to investigate the EMI occurring mechanism from a signal trace of a board. Fig. 2 shows the board layouts and their EMI characteristics. These boards have the same signal circuit structure but different board width. I could not explain the reason why these characteristics are different for a long time.

At one time, I received a regular journal as usual. When I swung it out, I came across a figure which showed the test configuration for measuring power-distribution circuit characteristics of PCB [2].

The power-distribution is a circuit which supplies DC power to ICs on a board. In many cases, the power-distribution trace has the same size of the ground plane, that is, it has same size of the board. That paper evaluated characteristics of the power-distribution circuit by S_{21} , high frequency parameter. I immediately

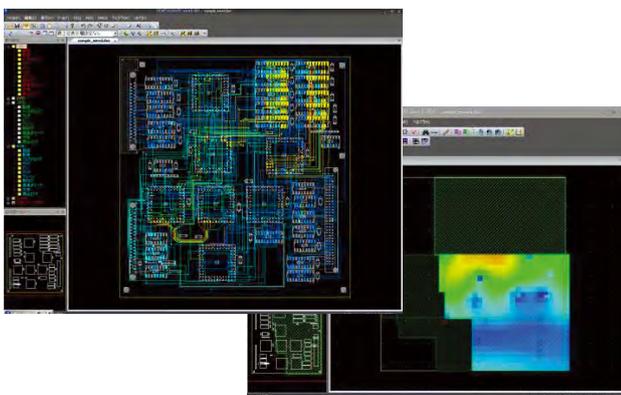
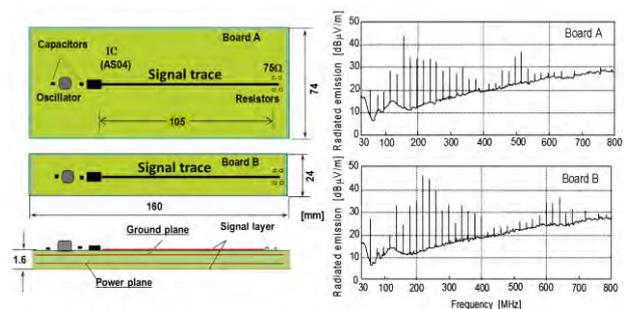


Fig. 1 EMI suppression support tool for PCB



(a) Board layouts (b) EMI characteristics
 Fig. 2 Four-layer PCBs and their EMI characteristics [3]

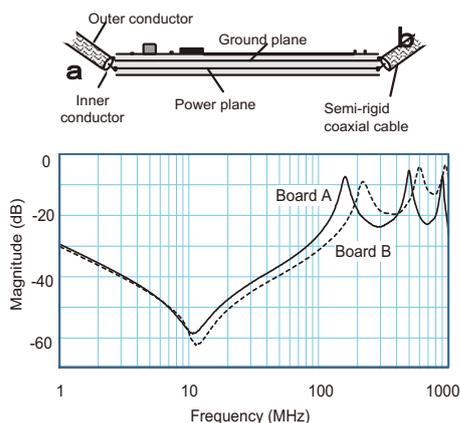


Fig. 3 S_{21} s of the power-distribution circuits [3]

applied that method to our boards. As a result, I found that resonances occur in the power-distribution circuit at high frequencies, and those frequencies coincided with those of EMI peaks. “I’ve got it!” I shouted in spite of myself at that moment. Fig. 3 shows the S_{21} characteristics of the sample boards. The resonant frequencies depend on the board width. The resonance is observed at 170 MHz for Board A, and 220 MHz for Board B. These frequencies coincide with those of EMI peaks for both boards. Until then, I was under impressions that EMI is only generated in signal traces, and that only DC current flow in the power-distribution circuit. These subjective impressions were disturbing my consideration.

Based on this expertise, we proposed our original power-distribution model by applying the transmission line theory to describe its high frequency characteristics [3,4]. This model has been adopted in the above-mentioned tool as the power resonance simulation.

4. Tips obtained from Discussions

When I became involved in the EMI field in the early 1990s, the theoretical EMI control was an urgent issue for every electronics company. This was a relatively new task, so that there was little expertise for designing product from EMI point of view. Under such circumstances, a university professor established a new research group in a society to solve these issues technically. And researchers and engineers from industries, including me, joined the group. Though the companies were in a competitive relationship, our motivation was the same. There obtained many tips from our discussions. Here I will introduce one of them.

When discussing the relationship between PCB traces and EMI, a certain structure became a topic. In a multilayer PCB, a signal traces sometimes changes the layer as shown in Fig. 4. What would happen with this structure? At that time, one of the members questioned about the path of return current. In a digital circuit, when a signal current flows on the board trace, a return current always flows on the nearest ground plane or reference layer. That question sparked off a discussion, and finally we clarified the EMI occurring mechanism. That is, where the layer of the signal trace changes, the return current flowing layer also changes, and this

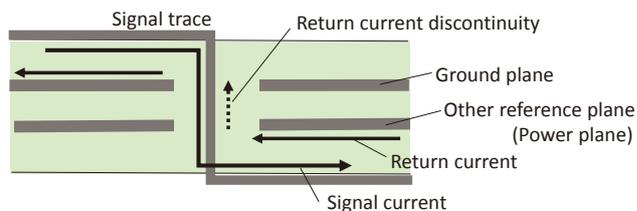


Fig. 4 Cross-sectional view of a four-layer board in which the signal trace transitions from the first layer to the fourth layer

return current discontinuity causes EMI.

Until that time, the behavior of the return current was hardly considered in the digital circuit, although it was common in the transmission line theory. Since then, board design has been carried out by taking care to reduce interlayer traces as much as possible. This finding is reflected in the above rule check tool as an EMI reduction rule.

5. Conclusion

Each noise generation mechanisms described here are widely known now. Through the accumulation of these efforts by professors, researchers and engineers in this field, EMI control has been systemized, and evolved from empirical rule to the technology.

I will show my opinion about the process to clarify the mechanism of unintentional phenomena like a noise below. By keeping consideration of such an unexplainable event, it is noticed somehow, but it does not appear in consciousness. Certain encounters make the potential understanding technically meaningful, just like fitting the last piece of the jigsaw puzzle. They are the casually glanced literatures or free discussions with colleagues. I hear that such a process applies not only to our field but also to all research fields.

I greatly appreciate societies including IEICE and my colleges for providing me intellectual activities.

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Development of the Phased Array Weather Radar

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1. Introduction

With the advancement of society in recent years, such as tornado damage in Tsukuba city in May 2012 and torrential rain damage repeated every year, tragedy accidents caused by such atmospheric phenomena are increasing. An X-band phased array weather radar capable of observing meteorological phenomena such as cumulonimbus causing such heavy rain and tornado, etc. in the shortest 10 seconds has been developed by Toshiba Corporation, Osaka University/Tokyo Metropolitan University under a grant of NICT. (Fig. 1) [1, 2]. Compared to conventional mechanical scanning methods, this radar dramatically improves the time required for observation by using the electronic scanning method. Since 2012, it is installed on the rooftop of the Electrical Engineering building of Osaka University Suita Campus, and it is continuously observing thunderstorm. In this paper, I would like to introduce the history and outline of this radar development, the observation results, and the future efforts.



Fig. 1 Photograph of the Phased Array Weather Radar in Osaka University Suita Campus

2. Background

Do you remember the tragic water accident that occurred in the Toga River in Kobe City, Hyogo Prefecture, on July 28, 2008? In the accident, 16 people who were in the Toga River and riverbed due to water play, suddenly experienced sudden, localized torrential rains in Kobe City and were swept away by a sudden rise in water level, including 2 elementary school students and 1 nursery school child. Alternatively, a tornado accident occurred in Tsukuba city, Ibaraki Prefecture on May 6, 2012 and a tornado accident in Koshigaya city in Saitama Prefecture in September 2013 are also remembered. In recent years, atmospheric phenomena such as torrential rain or tornado causing such sudden and locally serious damage known as

guerilla heavy rain are said to be increasing. There are also predictions that such weather disasters will occur more frequently in the future.

The most effective means to measure such phenomena is remote sensing technology using electromagnetic waves, well known as radar technology. The advantage of this means is that it is possible to observe the structure of rainfall distribution in a wide range of dozens or hundreds of kilometers by using electromagnetic waves in a very short time. For this reason, the Ministry of Land, Infrastructure, Transport and Tourism and the Japan Meteorological Agency have established a large-scale radar observation network covering the whole of Japan, and we can also know the distribution of rainfall over Japan in real time. Then, using the rainfall map captured by such a radar observation network, municipal corporation make judgement for evacuation.

3. Phased Array Weather Radar

Radar (RADAR), which is a typical example of radio application engineering or remote sensing technology, usually uses a parabolic type antenna, and rotates in the azimuth direction by 360 degrees in a certain elevation angle. In a conventional mechanical scanning radar system, the elevation angle is gradually raised as rotating the antenna. However, with this method, it takes about 1 to 5 minutes only for scanning near the ground, and 5 to 10 minutes or more is required for 3D stereoscopic observation. On the other hand, since the cumulonimbus clouds or thunderstorm which causes the above-mentioned local heavy rain rapidly develops in about 10 minutes and the tornado also occurs and moves within only a few minutes, in the radar system so far, such phenomenon is taken as a snapshot. Although it can be captured, it was difficult to continuously and sequentially observe the process from its occurrence to development and disappearance. This was one of the major drawback to understand the mechanism of generation of these atmospheric phenomena, discovery of the precursor, early warning and prediction.

In response to such a situation, Toshiba, NICT and Osaka University group uses electronic and software-like scanning method called phased array and digital beam forming method rather than mechanical antenna scanning, and develops the X band phased array Doppler radar which can drastically shorten the observation time and allow 3 dimensional rainfall structure in detail in a dramatically short time of 10 seconds to 30 seconds. This research and development

is a part of a commissioned research project by the National Institute of Information and Communications Technology, and Toshiba Corporation and Osaka University entrusted this research and development. Starting in 2008, after completing mid-term evaluation, it ended in 2013, but research and development itself was a lot of trial and error, and a large number of study meetings were held. In particular, various trade-offs are conceived to maintain the observation accuracy at the same time without impairing the high-speed property, and numerous numerical experiments have been carried out, and there arises a necessity to discuss issues peculiar to the phased array radar.

Phased array radar is a system that controls the phase of electromagnetic waves radiated from a large number of aligned small antennas on a circuit rather than mechanically moving the antenna vertically and horizontally like a conventional radar [3]. Since it is possible to form a beam at high speed, it is suitable for high-speed scanning compared to a mechanical driving type.

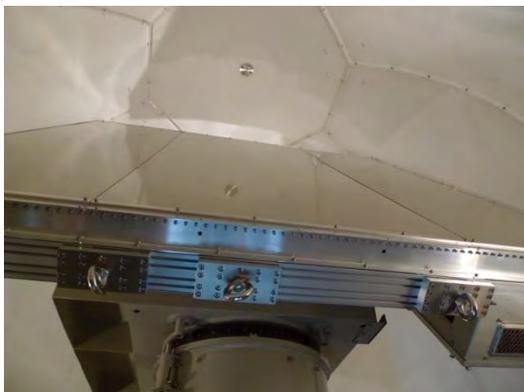


Fig. 2 Photograph of the antenna in Phased Array Radar System

Fig. 2 shows the antenna part of the radar system developed this time. 128 antennas are arranged under this panel on the plane, and 24 elements out of the 128 antenna elements are used to transmit a relatively wide transmit beam around 10 degrees in the elevation direction from 0 degrees close to 90 degrees in the zenith direction by switching the phased in each antenna. This is the beam transmission by the phased array method. Then, scattered waves backward by the precipitation particle group are received by antennas of

128 elements, then transferred to digital conversion processing, synthesized processing is performed on software, and a reception beam width of about 1 degree is obtained. This is so called digital beam forming technology. The combination of such a phased array and digital beam forming technology made it possible to scan at high speed over 100 elevation angles without mechanically moving the antenna in the elevation direction. Then, by mechanically rotating in the direction of the azimuth angle, detailed three-dimensional precipitation distribution without gaps in the range of about 15 to 60 km in radius and altitude of 15 km is observed within 10 to 30 seconds.

After installing on the rooftop of E3 building in Osaka University Suita Campus in May 2012, we are continuously observing through the year to the present. Various types of rainfall events and cumulonimbus clouds were observed during that time, but here is an example observed in 2013 (Figure 3) as one example of observation. This is a case where a linear rainfall system was formed from northern Osaka to Kyoto city. The area with strong rainfall is shown in yellow to red warm color system. Thus, in this phased array radar, it is understood that it succeeded to closely capture the three-dimensional structure of the precipitation system generated within the radius of 60 km over 100 elevation angles. Also note that such areas with high rainfall are often formed in high altitude. Focusing attention on the temporal change of each precipitation cell (unit of convection constituting the cumulonimbus) constituting such a precipitation system, as shown in Figure 4, a precipitation core is formed in the core of the thunderstorm cells. This is a major advantage of this phased array radar, and it became possible to follow the process of development of thunderstorm in detail as a continuous image by fast scanning. In this way, the developed phased array radar was able to capture the behavior of cumulonimbus clouds that are generated, developed, and changed in a short time.

As we have seen above, the images or animations shown by the data captured are very impressive, indicating the high potential of this phased array radar. After the development of the radar, we had a tour for the media, and we were able to gain participation from a number of news organizations and reporters. If I remember correctly, nearly 1,000 people or more have

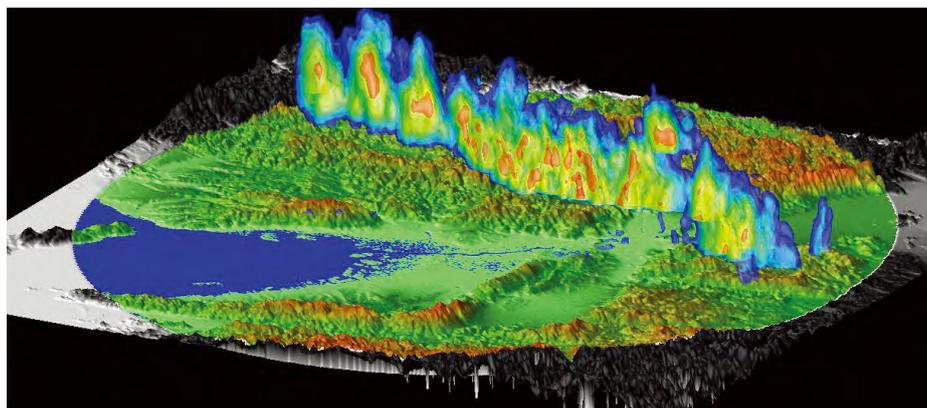


Fig. 3 Bird eye view of the band type echo observed by the Phased Array Weather Radar (by S. Yoshida, MEC)

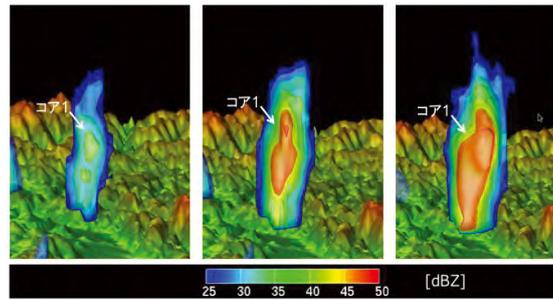


Fig. 4 Time series of thunderstorm cell at 12:33, 12:35 and 12:38 (From left to right)

visited the site so far. In addition, when introduced at a conference abroad, it was also taken up as a research spotlight in academic journals. Furthermore, it was published in the textbooks of junior high school science department.

When we held a public symposium on this phased array radar [4], it was a great success, reflecting the heightened social attention to natural disasters such as guerrilla torrential rains and tornadoes. Japan has become one of the most sophisticated society in the world now, but such natural disasters still threaten our lives. In order to reduce such natural disasters as much as possible and realize a safe and secure society, various technologies, including information and communication technologies, will play a major role in the future.

4. Future

In the near future, we will conduct observations that combine performance evaluation research with phenomena such as localized heavy rain and torrential rain, and will also make efforts for various applications. Fortunately, it was adopted as one of the Strategic Innovation Promotion Programs (SIP: Strategic Innovation Promotion Program) since FY 2014. In this program, we are conducting R & D on a dual polarized phased array radar which makes it possible to further measure two vertical and horizontal polarized waves. This will have a greater social response than the current phased array radar, and by doing so will lead the world

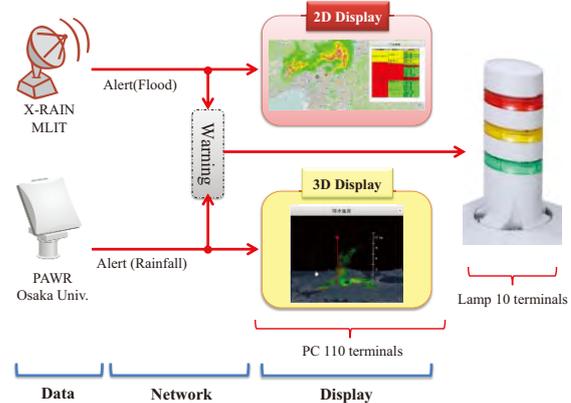


Fig. 5 System configuration in the field experiment with Osaka Prefecture

further in this research field. At the same time, the detailed three-dimensional observation data obtained using the current radar will clarify the mechanism of cumulonimbus which brings heavy rain in a short time. This means that a major breakthrough in the fundamental science, and some kind of discovery is made using this radar. It will also be applied as a highly accurate meteorological prediction, as detection of precursors of local and sudden meteorological disasters, and short-term forecast (Nowcast) information. Actually, from the summer of 2015, although it is experimental, jointly with the Osaka-shi Fukushima-ku, the trial of the guerilla heavy rain bulletin started. Although it is still pilot operation, not open to the

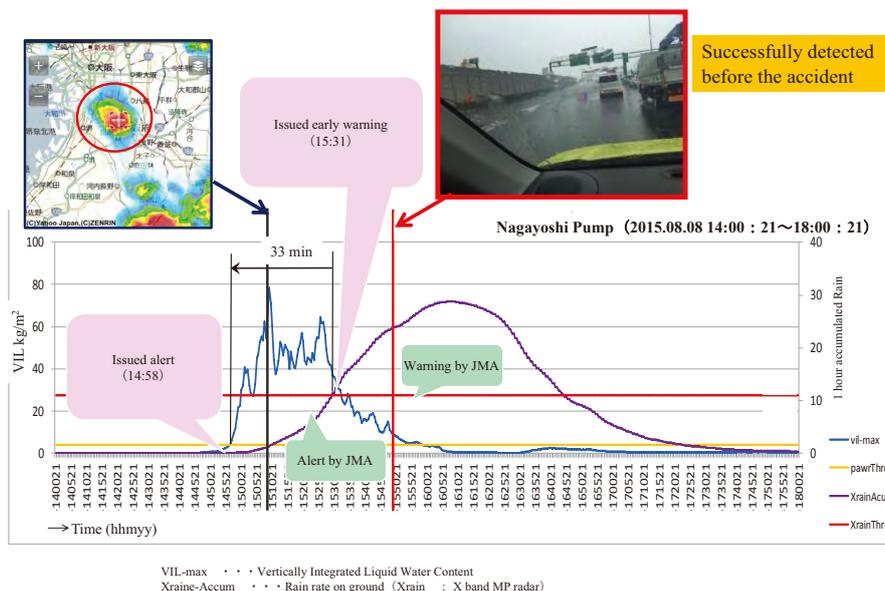


Fig. 6 One example of the result of field campaign with Osaka Prefecture

public, but I would like to continue to make improvements on the system and use it for practical use in the future. In addition, we also started a demonstration experiment with Osaka prefecture including roads, or river dealing departments. In this experiment, we have developed a terminal which can see the three-dimensional image of this radar and Vertically Integrated Liquid Water Content (VIL) in real time. We are seeking ways to make use of it (Fig. 5). Fig. 6 shows an example of the data obtained in this demonstration experiment. In the figure, the one shown by the purple line shows the cumulative rainfall at the point where the flood occurred, and before the peak, VIL indicated by the blue line shows the local maximum value. This indicates that a core of heavy precipitation was formed above the observation point, and this core fell to the ground, reaching the peak of the precipitation, causing the flood. In this way, it was demonstrated that by utilizing the high space-time performance of this radar and by catching the information in high altitude, it could be linked to early warning. The PAWR shown here is a phased array radar, and XRAIN is the X band multiparameter radar operated by the Ministry of Land, Infrastructure and Transport.

After the development of this radar, the same radar was installed in NICT Future ICT Research Center in Iwaoka Town, Kobe City (Fig. 7). The world's first phased array radar network system was realized. The layout is shown in Fig. 8. Such a network type radar system has great advantages in several aspects. In such a network environment, more accurate precipitation estimation will be possible, and robustness is ensured as the whole system as well. Then, in a network, a high-speed and high-resolution radar group is regarded as one high precision high resolution ultra-large radar, and various applications are operated in the network. This future image will be very attractive and will be paid more attention than ever. This is exactly the image of the next generation disaster prevention system in Japan and undoubtedly will be the most advanced and safest system in the world. Based on the results of such investigation, we are planning field campaign in the Tokyo metropolitan area for around 2018 fiscal year. This is aimed at contributing to ensuring safety from torrential rains in marathon and efficient game management in the upcoming Tokyo Olympic. In the Olympic, media and press from all over the world will get together and this will a great opportunity to advertise the Japanese technology to the world. In addition, the Meteorological Research Institute of Meteorological Agency install a same phased array radar in the Tsukuba area within FY 2014 and start studying for practical use.

Finally, the success of this radar development was due to the strong collaboration between industry, government and academia. Production capacity of producer, ability of coordination of officials, research ability and knowledge of academia complemented each other, and great comprehensive power was

demonstrated. Toshiba, NICT and Osaka University have been conducting joint research for many years, and the basis of trust built there was the foundation. I would like to continue doing such efforts in the future. We will continue to ask for continued support and encouragement in the future. Last but not least, I thank you for giving me this opportunity.



Fig. 7 Phased Array Weather Radar installed in Kobe city

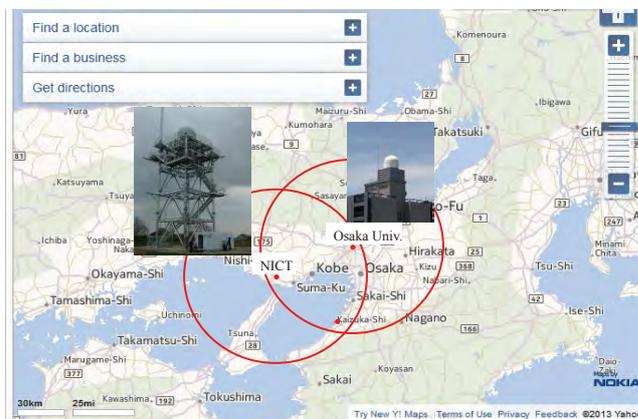


Fig. 8 Network configuration of Osaka Phased Array Weather Radars

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My Life and Time as a Researcher

Prakash Chaki
Central Research Laboratories, NEC Corporation



1. Introduction

“If we knew what we were doing, then it wouldn’t have been called research, would it?” – A. Einstein.

I was born and brought up in a beautiful suburban town in the state of West Bengal in India. My hometown is a quiet, peaceful industrial township. Contrary to the hustle and bustle of big cities, I grew up in a simple and disciplined household where academics were always given the highest priority. On a lighter note, growing up in a neighborhood where most of my seniors and friends went to engineering schools, I always knew that I would not have many choices either and my career might also fall in similar lines. As expected as it could get, I completed my undergraduate studies in Electronics and Communication Engineering followed by masters in Electrical Engineering specializing in Communication and Signal Processing. I owe immensely to my graduate school IIT Bombay for shaping the person that I am today; all the treasured associations I had there, the culture I imbibed and the priceless values I learnt there are immeasurable additions to my life and soul which will stay with me forever. I wrote my graduate thesis on Medium Access Control (MAC) protocol design to improve the throughput of unlicensed users in a particular setting of Cognitive Radio Networks. It came to me in the most unplanned way that it can ever get when I decided to move to Japan after getting recruited by NEC Central Research Laboratories in my final year of graduate studies. And started a new phase in my life to which when I look back now, I feel a deep sense of gratitude for the many ways it has enriched my life. In sharp contrast to most other foreigners working in Japan as a researcher, neither did I graduate from any Japanese university nor did I attend any language school. Thus things were certainly not easy for me to say the least, but each of the tough periods that I had to grind through have helped me better myself as I have always believed that success do not come easy, and definitely not if you choose to stay in your comfort zone. Failures have taught me way more than what success has, so adopting a safer alternative has never been the way. I feel a deep sense of gratitude to all my advisors, collaborators and colleagues whom I was blessed to have worked or interacted with, in different capacities. I have learnt and grown immensely from my interactions with each of them. They have shown great faith in me and my potential, more than my own belief in myself; their wisdom, persistent encouragement,

patience and tireless enthusiasm have shaped my growth. Without them, I could have lost my way altogether and coming this far would definitely not have been possible.

2. Early Days of Research: Research at University

In my graduate school days, while I was still trying to figure out the meaning/objective of research and the many ways of doing it, I delicately nurtured the dream of making it my profession. Looking up to the eminent professors around and accumulating with great care every small experience of valued interactions with them, I knew the goal was too far away and it will take lot of perseverance.

I wrote my graduate thesis on Medium Access Control (MAC) scheduling algorithms for unlicensed/secondary users in a specific setting of Cognitive Radio Networks (CRN) called Symbiotic Cooperative Relaying. In this setting, unlicensed secondary users operate as relay nodes for licensed primary users, earning some incentive in terms of time or frequency in return, exploiting which they can pursue secondary-to-secondary communication.

After graduation, I worked on a separate project on CRN in another laboratory where I was involved in simulation based performance evaluation of MAC protocols for a multi-channel CRN, details can be found in [1].

3. Research in NEC: Wireless P2P Networks

3.1 Seamless Group Reformation

One of my early works after joining NEC laboratories was centered about exploiting the features of peer to peer wireless networks for applications including but not limited to car-to-car communication, large scale content sharing in crowded places. While typically such networks rely on a single node assuming the leadership role to which other nodes remain associated, I worked on getting rid of overdependence on a single node as it risked network connectivity if the leader node left the network without notice. Such a scenario is commonplace in dynamic settings like vehicular networks as nodes join and leave such proximity-based networks very frequently, due to node mobility. In addition, a P2P network is based on cooperation from all participants; asking a single node to drain its power to support connectivity to others is not a sustainable model. My work resulted in an algorithm for dynamic and seamless leadership transfer among the nodes by exchanging an emergency leadership intent among nodes during first time

connection, ranking the emergency leaders based on some scores and sharing this information periodically within the network. The real catch in the work was the “seamless transfer” of leadership which was made possible by a novel scheme that skipped the time-consuming security key generation and key-sharing handshake phase that typically takes place at first time connection establishment. Consequently, it became possible to expedite the connection with the emergency leader when the incumbent leader left.

The proposed scheme drastically reduced the network disruption time during leadership transfer and fetched me an award too. I implemented and tested the algorithm in a Wi-Fi P2P network of physical devices the details of which can be found in [2]. During the course of this work, I gained exposure to construction of Linux-based testbed for Wi-Fi related experiments. I feel the highest gratitude for my then advisor at NEC from whom I learnt many intricate details of experimentations with Wi-Fi P2P network. Another related work can be found in [3].

3.2 Dynamic Topology Reformation

My second work on Wi-Fi P2P networks constituted modeling a virtual overlay network on top of an underlying physical network whose topology is dynamically varying. In the underlying physical network, nodes switched connections among multiple disconnected P2P networks to ferry information from one to another. Thus the physical network did not have a continuous end-to-end connectivity from source to destination which stopped us from using TCP or UDP sockets between them. To circumvent this problem, we proposed overlay network on top of this physical network where the overlay network encapsulated the dynamic changes in topology happening underneath. Implementing the system model on wireless networks of physical devices, we showed that a source node from one network could directly ping the destination node in another network using TCP or UDP connections over the virtual overlay, while packets were actually delivered by the underlying network of varying topology. The work [4] fetched us an award from IEICE Communication Society in 2017.

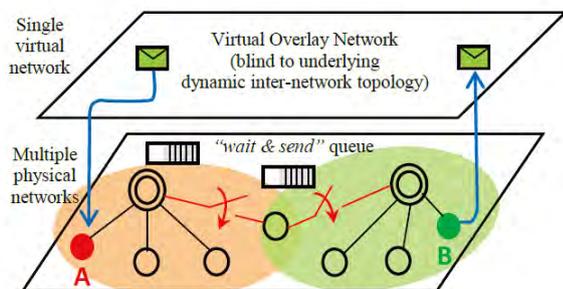


Fig. 1 Simple model of a Virtual Overlay Network that encapsulates the underlying topology change among multiple wireless P2P networks and allows end-to-end TCP communication

3.3 Game-Theoretic Analysis of Delay Tolerant Networks

In this joint work with Osaka University, I tried to explore the optimal user strategies for content sharing in Delay Tolerant Networks (DTN). DTNs have gained significant research interest for distributed content storage and retrieval systems and also making contents float centering an anchor zone. Content sharing in DTN is largely dependent on the cooperation of participating nodes because messages are delivered in a *store-carry-forward* approach. But in real world applications, nodes are rational entities who wish to maximize their own benefit from the network. Thus, it is logical that nodes would not wish to store data (contents) just for the sake of forwarding it to someone else, unless the node itself is interested in the same content. Also nodes would strategize their mobility so as to collect their desired contents at minimum cost. We investigated the optimal strategies of a user in a Public Goods game framework and formulated the condition when non-cooperation is costlier than cooperation. Details can be found in [5].

4. Research in NEC: Coding Theory

I started working on polar codes in 2016, at a time when this latest sensation in the field of Forward Error Correcting (FEC) codes had begun to gain attention of 3GPP standardization group as a possible candidate for the 5th Generation (5G) mobile communication systems. For the uninitiated, polar codes are the first family of provably capacity-achieving codes for the Binary Input Discrete Memoryless Symmetric (BI-DMS) class of channels. But their finite length performance was not very competitive initially when compared to other state-of-the-art FEC codes. Lot of research has been done across the world over the last decade for improving finite length performance of polar codes and consequently they were officially adopted as FEC code for Enhanced Mobile Broadband (eMBB) control channels in 5G New Radio (NR) systems.

At NEC, I worked with my advisor on various aspects of polar code encoder and decoder design. Specifically, we showed low-complexity design of short length polar codes from a long mother code in [6]. We also worked on design of different variants of concatenated polar codes with the aim of increasing the minimum distance of the resulting code, or reducing decoding latency at the time of decision error etc. My ongoing work includes different aspects of polar code encoding and decoding.

5. Experience as a Standardization Delegate at 3GPP RAN1

I participated as a delegate in 3GPP RAN1 meetings for standardization of 5G NR for a span of nearly 6 months in 2017. It was during this time that the specification of polar code for eMBB control channels (both uplink and downlink) was designed. Getting involved in standardization activities was a gem of an experience for me which gave me much clarity of how

the industry works together to decide on technologies for the future. The entire flow of preparing and submitting contributions to 3GPP meetings, discussing with peers from other companies and engaging in the decision making process gave me a lot of exposure about this field which was otherwise an uncharted territory to me.

6. Life Outside Work

I love to travel when I have time. Japan is an exquisitely beautiful country with vast expanses of green mountains, quaint countryside, serene sea sides and the vibrant metropolises. Since I live in the city, the green nature of the countryside have special place in my heart. I have traveled to many places; some fond memories include climbing Mt. Fuji, the picturesque landscape in Yamanashi prefecture, winter sports in Tochigi, pristine traditional towns in Gifu prefecture etc.

I have been always been fond of engaging in extra-curricular activities when I am off study or work. Sports and fitness are very dear to me; I play badminton on free weekends. I also take interest in drawing sketches, cooking at home, reading at cafes and doing volunteering activities.

7. Message to the Readers

I would just like to share something that I have learnt from my own experience, with utmost humility. We should not confine ourselves too much in one narrow area of research. We often tend to make our own comfort zone centered around things that we feel comfortable with. This happens unconsciously and stops our all-round growth. I feel research is more about aptitude and problem-solving skills. Yes, we need to spend significant amount of time in one specific topic to go to its depth and then solve problems. But let us not be hesitant to challenge ourselves if some new topic comes our way which might require us to master some new skills. Just that we have not done something before, should not stop us from working on that topic. Skills that we master in one project, stay with us and can always come handy in another project. So keeping an open mind towards many different research topics in your area might help. To give an example for making things clearer, if you specialized in communication, then do not restrict yourself to one specific layer like network or MAC layer. If the option comes your way, allow yourself to work on physical layer too. The more topics we expose ourselves to, equips us with more research skills and ability to think differently. Another thing is that, research has gone more and more inter-disciplinary these days; doing a good work requires a very wide skillset from different disciplines. So if there is opportunity in your laboratory, try to collaborate with people of different specializations and you can learn immensely from each other. End of the day, it is all about learning new things.

8. Closing Note

Life as a researcher has been one fascinating journey so far with unique surprises waiting at every corner of the road. At times it has been like going through a dark tunnel where I do not have the slightest clue of what is waiting for me at the end of it, such is the uncertainty and probability of failure. But on the flip side, that is also the good part of it. It tested my aptitude every now and then; fostered my growth as a human being and also helped me understand myself better. Because of the uncertainties involved, it never gets too dull. Considering the manifold topics I got to work with, different places I studied or worked at and the diverse people I associated or collaborated with in this journey, it has immensely broadened my mind and outlook. I look forward with childlike excitement to unravel what future has in store for me.

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A Foreign Researcher's Career Path in Japan

Ved P. Kafle

National Institute of Information and Communications Technology



1. Overview

Born and raised in Nepal, I have been living in Japan for fifteen years. I spent the first three years as a PhD student, and the latter twelve years as a researcher of communication networks at the National Institute of Information and Communications Technology (NICT), Tokyo. I have been enjoying my professional life, not to mention, social and family life as well. Before I describe about my profession, I like to mention about my background related with Japan. A previous version of this article was published in the IEICE Communication Society B-plus magazine in Japanese [1].

2. Affection with Japan

I had heard of and felt Japan in my early childhood. I had heard of it as a country of rising sun, proper discipline, and perfect time management. I had felt it as the manufacturing country of then popular brand of National Panasonic transistor radios and Seiko 5 watches, which were highly praised at my home and neighborhoods.

Since then, an interest to visit Japan to see and feel it more was deeply rooted in my mind. After graduating from high school and coming to the capital city of Kathmandu, I could see Japanese tourists walking in the streets surrounding popular monuments, usually in well-disciplined groups guided by tour guides. My enthusiasm to explore further about Japan went on expanding. In my undergraduate course, when I came to know that the popular rooftop terrestrial television antenna (commonly known as Yagi-Uda antenna) was invented by Prof. Shintaro Uda and Prof. Hidetsugu Yagi of Tohoku University, my curiosity to know more about Japanese university education and research started escalating.

While I was studying master's degree course in Seoul National University, Republic of Korea, a Japanese professor from National Institute of Informatics (NII) visited our lab. He gave a presentation on his institute's and lab's research on various fields of information and communication technologies, such as artificial intelligence, robotics, spoken language processing, multimedia processing and communication, mobile and optical networking, and computer graphics. He also talked about various scholarship programs available for competent PhD students at NII, which was hosting the Informatics Department of the Graduate University for Advanced Studies (also known as Sokendai). Based on his information, I applied for admission to the PhD program. Consequently, I came to Japan to start a new phase of my life.

3. Student Life in Japan

My real experience with Japan began at NII, where I found a very friendly and enjoyable environment for foreign graduate students and researchers. The language of communication was English, that is, all courses were offered in English, and regular research meetings and seminars were also conducted in English. Moreover, there were weekly Japanese language classes for foreign students where I started learning from the Japanese alphabets (Hiragana and Katakana) and could attain a proficiency level of basic conversion within a few months. NII provided a peculiar type of graduate school environment where professors and postdocs doing research on cutting-edge technologies outnumber the graduate students studying for their PhD degree. All students had their desks in the same big room, each getting a small private space separated from one another by a partition. So, each day we had plenty of opportunity to have friendly interaction with many professors, visiting researchers and fellow graduate students, not only related with our own research areas, but also with multi-disciplinary topics. I studied three years to fulfill all the requirements of course work, paper publications, and thesis writing, and obtained the PhD degree in Informatics.

4. Involvement with IEICE

I was introduced to the activities of the Institute of Electronics, Information and Communications Engineers (IEICE) and motivated to get involved in it as a student member by my supervisors Prof. Shigeki Yamada and Prof. Eiji Kamioka at NII. I became a student member of IEICE Communication Society within the first semester of my study. I made the first presentation of my research work in a meeting of Technical Committee on Mobile Multimedia Communication (MoMuc) in Kyoto when I was in the second semester of my study. Since then I have been actively involved in IEICE by presenting papers time to time in various technical committee meetings (Kenkyukai). Recently I have finished five years of volunteer service as a member of the editorial board of IEICE Transactions on Communication (English) and a member of the Technical Committee on Information Networks (IN). I am joining another technical committee soon.

5. Professional Life in Japan

After completing my PhD, I joined the National Institute of Information and Communications Technology (NICT) as a postdoc researcher (official known as Expert Researcher) to do research on the New Generation Network. The well-known project,



Fig. 1 Paper presentation at a conference

named AKARI Architecture Design Project, had just started at NICT during that time, which was led by Prof. Tomonori Aoyama (University of Tokyo). The project members included researchers of NICT and professors of various universities such as the University of Tokyo, Keio University, Osaka University, and Tokyo Institute of Technology. The project, managed initially by late Dr. Masaki Hirabaru and later by Dr. Hiroaki Harai, aimed at the clean-slate design of New Generation Network architecture and technologies. The project covered various topics, such as new numbering and addressing schemes, ID/locator split-based architecture, network virtualization, security-by-design, and optical path/packet integration. I was responsible for the research on ID/locator split-based network architecture. Consequently, I designed a new architecture, called HIMALIS (Heterogeneity Inclusion and Mobility Adaptation through Locator ID Separation) and related protocols. The major objectives of this new network architecture were as follows: (1) to incorporate heterogeneous types of user terminals or end devices, such as computers, phones, sensors, and actuators, to use heterogeneous types of network protocols suitable for their capability; (2) to support mobility natively from the network layer; (3) to provide in-built security mechanisms for network access control, authentication, and data plane security. I presented and published several papers on this research in conferences (one example shown in Fig. 1), journals and standards development organizations. The mechanism for enabling seamless communication among devices connected to heterogeneous networks, and the mechanism for generating identifiers of devices from their hostnames, storing the mapping between the identifiers and locators of devices as records in a name resolution system, and providing the mapping records to querying devices in very low latency have been standardized in ITU-T Study Group 13 and demonstrated at the ITU Telecom World 2015 held in



Fig. 2 Research outcome exhibition at ITU Telecom World 2015 in Budapest, Hungary

Budapest, Hungary (Fig. 2).

After few years of joining NICT, I became a permanent researcher through an open competition. Currently, I am a research manager, and engaged in R&D of network automation technologies that would enable us to create and control virtual networks on-demand according to the diverse quality of service requirements of IoT application services. Concurrently, I am working as a visiting associate professor at the University of Electro-Communications where I am engaged in supervising graduate students on their research on latest networking technologies. I am also volunteering as a Rapporteur in ITU-T Study Group 13 to develop standards of emerging network technologies, such as information-centric networking (ICN) and ID-based communication for future networks.

6. Conclusion and Take-away Message

In conclusion, I would like to write about my experience to become a successful ICT researcher in Japan. Although I do not claim that I am an exemplarily successful researcher in Japan, but it is sure that I am enjoying both the research and teaching works here. In my experience, we need to possess a few key capabilities to build our successful research carrier in Japan. The first capability is that you should be able to develop highly professional and cordial relation with our supervisors and professors. Japanese society believes in group trust and collective efforts, rather than in individual or isolated efforts. Therefore, a trustworthy recommendation from your professor or supervisor is the essential requirement to get a good job or timely promotion. The second capability is that you should be able to select and pursue research on futuristic topics that would be integral part of some new technology, which would be highly demanded by the society within a few years. This would help you in justifying the importance of your research as well as your existence in your organization. The third capability is that you are eager to acquire up-to-date knowledge about multidisciplinary subjects related with your research. You are open-minded and capable to explore various approaches to timely addressing research problems. The fourth capability is that you are an outgoing person and eager to contribute to various professional societies and regularly participate in their activities. This will help you remain aware of the latest research being pursued by your peers, as well as disseminate your research outcome to the society. At last, I would like to share with you a statement that my supervisor (Prof. Yanghee Choi) in Seoul National University used to say, “A successful researcher requires to appropriately balancing time in three tasks – research/teaching, presentation, and professional networking”.

7. Reference

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IEICE Fellow Conferred on 9 IEICE-CS Members

Yoshitaka Enomoto
 Director of Planning and Member Activities,
 IEICE Communications Society



1. Introduction

The title of IEICE Fellow is conferred on IEICE members who are recognized as having made a significant contribution to the institute in academic, technical or related fields. In 2017, IEICE Fellow is conferred on 29 IEICE members including 9 from Communications Society (CS) who are listed in Table 1.

2. The Conferment Ceremony

On 22nd March during IEICE General Conference 2018 in Tokyo, the 18th Fellow Conferment Ceremony was held (Fig.1). In the Ceremony, Mr. Hiromichi Shinohara, the president of IEICE handed a fellow badge and a certification plate to each new Fellow.

3. Next Fellow Conferment Ceremony

The next ceremony is going to be held in Tokyo, March, 2019.

Hisato IWAI	Study on Radio Propagation and Its Application Techniques in Wireless Communication
Atsushi IWATA	Research and Development, Field Trial and Commercialization of SDN/NFV Technologies and Solutions
Takatoshi SUGIYAMA	Research and Development of Superposed Signals Transmission Technologies in Satellite and Mobile Communication Systems
Qiang CHEN	For Contribution to Fast and Accurate Methods of Computational Electromagnetics for Antennas and Dielectric Material
Hidenori NAKAZATO	For Contributions to the Development of QoS Control Technologies and the Editorial Activities of IEICE Transactions
Hiroshi NAKAMURA	Promotion of Research and Development and Standardization on 3rd and 4th Generation Mobile Communications Systems and VoLTE Systems
Hiroshi NARUSE	Research and Development of Fiber Optic Strain Sensing Technologies and Their Applications
Teruya FUJII	Leading Role for Establishing Novel Radio Propagation Model for Wideband Mobile Communications and its International Standardization

Table 1 New IEICE Fellows from Communications Society

Name	Contribution contents
Tadashi ITOH	Research of Network Systems and Leadership in Technology Development for Services Transformation



Fig. 1 Photo in the Fellow Conferment Ceremony with Mr. H. Shinohara, President of IEICE and Prof. M. Morikura, President of IEICE Communications Society

Report on the 10th IEICE Communications Society (CS) Welcome Party

Yoshitaka Enomoto, Manabu Kai, Koji Kamakura, Yoshiteru Takeshima, Akinori Taira, and Akira Yamada

IEICE-CS Directors, Planning and Member Activities



1. About Welcome Party

Welcome Party is one of IEICE-CS major activities held at every IEICE General Conference. The objective of having this party is to provide young engineers especially students with a good opportunity to meet and talk friendly with experienced researchers and engineers in various organizations.

It had been held at the IEICE Society Conferences in September from 2008 to 2011. However, considering school year in Japan (starting in April), in 2013, we moved it at General Conferences in March so that it can help students to think about their possible engineering carrier just before starting their new school year.

2. Welcome Party at 2018 General Conference

The 10th Welcome Party was held on 20 March 2018, the first day of IEICE General Conference at Tokyo-Senju Campus of Tokyo Denki University in Tokyo, Japan (Fig. 1).



Fig. 1 Welcome Party venue in Tokyo Denki University Tokyo-senju Campus, Tokyo

We held with Engineering Sciences Society (ESS), NOLTA Society (NLS), Electronics Society (ES), Information and Systems Society (ISS) of IEICE. Prof. Shigeru Yamashita from ESS, Dr. Toshikazu Hashimoto from ES, and Dr. Koichi Hamada from ISS joined to Welcome Party organizing members.

The Welcome Party was divided into 3 floors. ES President, Prof. Hiroyuki Uenohara, ESS President, Prof. Hiroshi Imai, and CS President, Prof. Masahiro Morikura delivered opening addresses and gave a toast in each floor (Fig. 2).



Fig. 2 Welcome Party opening addresses from CS President, Prof. Masahiro Morikura

303 participants including 89 students joined the Welcome Party. They enjoyed food and drinks (Fig. 3) as well as free talk and discussion at poster panels (Fig. 4).



Fig. 3 Enjoying food and drinks in floors



Fig. 4 Talk and discussion at poster panels

The poster panels were prepared by 22 companies and national institutes and 24 Societies, and Technical Committees (Fig. 5). The poster panels from Societies and Technical Committees are shown follows;

Engineering Sciences Society (ESS)/

NOLTA Society (NLS)

- System and Signal Processing Sub-Society
- Acoustics and Ultrasonics Sub-Society
- Technical Committee on Information Theory (IT)
- Technical Committee on Hardware Security (HWS)
- Fundamentals Review
- NOLTA Society

Communications Society (CS)

- Communication Society
- Space, Aeronautical and Navigational Electronics (SANE)
- Electromagnetic Compatibility (EMCJ)
- Communication Quality (CQ)
- Information and Communication Management (ICM)
- Ambient intelligence and Sensor Networks (ASN)
- Communication Systems (CS)
- Network Systems (NS)
- Optical Communication Systems (OCS)
- Optical Fiber Technology (OFT)
- Photonic Network (PN)

Electronics Society (ES)

- Electronics Society
- Photonics related technologies committee group
- Electromagnetic-wave related technologies committee group
- Circuits, devices and interdisciplinary technologies committee group

Information and Systems Society (ISS)

- Life Intelligence and Office Information Systems (LOIS)
- Pattern Recognition and Media Understanding (PRMU)
- Technical Committee on Plenoptic Time-Space Technology (PoTS)

The 15 short speeches are delivered by companies, national institutes, Societies and Technical Committees (Fig. 6).

NLS President, Prof. Tohru Ikeguchi, and ISS President, Prof. Yuichi Nakamura gave closing address and closed the Welcome Party.



Fig. 5 Communication Society (CS) poster panel

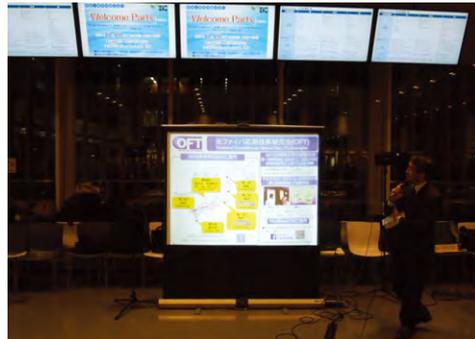


Fig. 6 Short presentation from technical committee

3. Conclusion and Acknowledgements

The 10th Welcome Party was successfully held with over 300 participants. The next Welcome Party will be held in March 2019 at the IEICE General Conference at Waseda University in Tokyo, Japan. We expect many people to participate in next Welcome Party.

We would like to thank all participants, especially from companies, national institutes, and Societies and Technical Committees members that gave speeches and/or prepared poster panels. We also thank Prof. Ryoichi Sasaki, Prof. Noriharu Miyaho, and Prof. Shigeo Wada of Tokyo Denki University for supporting Welcome Party.

Annual Report of Technical Committee on Information and Communication Management (ICM)

Masaharu Hattori (KDDI Research), ICM Secretary
 Masao Murata (Fujitsu), ICM Secretary
 Haruo Oishi (NTT), ICM Assistant



1. Introduction

The technical committee on ICM (Information Communication Management) is a technical committee of the Communications Society of the IEICE [1]. This article briefly reports the last year’s activities of ICM, and introduces the upcoming English session.

2. Activities

The ICM held two-day technical meetings 5 times from May 2017 to March 2018. The venues and the main topics of each meeting are shown in Table 1. In addition, 4 special sessions were sponsored by ICM as shown in Table 2.

Of particular note, in the English session in 2017 IEICE Society Conference at Tokyo City University, the number of papers reached 34 in total. This session was hosted and presented entirely in English. The purpose of this session is to promote the globalization of IEICE by providing the participants staying in Japan or joining from overseas with more opportunities for presentations and discussions in English.



Fig. 1 The panel session at Naha

Furthermore, ICM Workshop 2018 was held in Naha (Okinawa pref.). In the panel session, five invited speakers presented and discussed the theme, to the obvious interest of the approximately 60 attendees. A banquet was held to promote social intercourse, and at the same time, to celebrate the ICM annual award winners in 2017.

3. Awards and Upcoming Event

The winners are shown in Table 3. The English Session Encouragement Award is given to the author of the best papers of the English session every year. ICM committee is now calling for submission for the upcoming English session. The deadline is early in July.

4. Reference

[1] ICM, <http://www.ieice.org/~icm/eng/>

Table 1 ICM Technical Meetings in 2017

No	Date	Venue (City)	Main Topics	Joint
1	May 25-26	Kochi University of Technology (Kochi)	Service Management, Operation/Administration, Security Management, etc.	IPSI-IOT IPSI-CSEC
2	July 6-7	Hakodate Chamber of Commerce and Industry (Hakodate)	Management Function, Management Theory, etc.	-
3	Nov. 16-17	Takamatsu Center Building (Takamatsu)	Network Quality, Network Management and Measurement, Network Virtualization	CQ NS NV
4	Jan. 18-19	Sojo University (Kumamoto)	Applications and Research Opportunities of Life Log, Office Information System and Business Management	LOIS
5	Mar. 8-9	Okinawaken Seinenkaikan (Naha)	Element Management, Management Functionalities, Operations and Management Technologies, etc.	-

Table 2 Special Sessions by ICM in 2017

Title	Date	Remarks	Theme
English session	Sep. 12-14	A session held as one of the symposium sessions in IEICE Society Conference	Network and Service Design, Control and Management
APNOMS	Sep. 27-29	A conference in the Asia Pacific region sponsored by ICM and KNOM (The committee on Korean Network Operations and Management)	Network Operation and Management
CNSM	Nov. 26-30	A premier global conference technically sponsored by ICM	Network and Service Management
ICM Workshop	Mar. 8	A session held in conjunction with ICM technical meeting	Use of Data, Open Source and AI for Operation and Management

Table 3 Winners of ICM Awards in 2017

Award	Winners	Title
Research Award	Shinsaku Numata, et al.	Implementation and evaluation of Automatic system failure cause specification and restoration by using configuration management data from automatic building script
	Shingo Ata, et al.	A Framework for Automating Operation and Management with Combination of Traffic and Configuration Histories
	Manabu Nakanoya	Reinforcement Learning based Automated Process Generation for Virtual Network Update
English Session Encouragement Award	Weiwei Jiang	A design of an asymmetric resonator for wirelessly powered wearable ring device
	Van Cu PHAM	Cloud-based Solution for Connecting Multiple Home Networks using universAAL Space Gateway

Report on Indonesia-Japan Joint Workshop on Ambient Intelligence and Sensor Networks

Jin Nakazawa

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1. Introduction

Technical Committee on Ambient Intelligence and Sensor Networks (ASN) has been fostering the research community among academia and industry on sensing, processing, and network communication technologies for ambient intelligence. It is also focusing on applying those technologies to real world problems in various areas such as, but not limited to, agriculture, fishery, forestry industries, human health and medicine, city infrastructure.

ASN has been aiming at expanding its community to achieve more diversity in its members and research topics. As one of the efforts to this, it started a series of international workshops in 2015. The workshops were held so far in Singapore (2015) and Cambodia (2016), and in the last year (2017) it was held in Yogyakarta, Indonesia (Fig. 1) for three days from November 29th to December 1st.



Fig. 1 Yogyakarta, Indonesia

2. ASN and International Workshop

One of the major purposes of the international workshops is to have better understandings on the technologies for ambient intelligence in different countries which are based on different culture, different people, and different environment. Another is to provide community members with the venue that can be beneficial for presenting their work in English. Particularly, students are encouraged to train their presentation in English leveraging this series of workshops.

In the Indonesia-Japan Joint Workshop on Ambient Intelligence and Sensor Networks, we had about 30 participants including several students. We invited several researchers from Indonesian universities. They enjoyed the following workshop program together.

- Poster reception
- Research presentation sessions including invited talks
- Visit to Gadjah Mada University

The poster reception is for students to present their research work using posters while taking light meal and drinks. Though alcoholic drinks were not available in the workshop venue for religious reasons, the participants enjoyed discussion with the presenters.

In the research presentation sessions, 16 talks were given including two invited ones. Their topics range widely from wireless communication technologies through system software technologies to diverse



Fig. 2 Poster Session

applications in ambient intelligence and sensor networks area. Sharing such a diverse talks among participants seemed to have tightened mutual understandings on problems and technologies they are investigating on.

Finally the visit to a local university, Gadjah Mada University, helped us understanding environment, culture, and people in Yogyakarta.

3. Summary

This year, in 2018, ASN is planning to hold the 4th International Workshop on Ambient Intelligence and Sensor Networks in Hanoi, Vietnam in October. The details will be posted soon on the committee's website: <http://www.ieice.org/~asn/en/>. Please join the workshop, and have fun together!

Report on NS English Session at 2018 IEICE General Conference -BS-2 Innovative Information Communication Technologies for Future Network System Supporting Information-oriented Industry-



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1. Introduction

In the 2018 IEICE General Conference that was held on 20-23 March 2018, the IEICE Technical Committee on Network Systems (NS) [1] provided the complete English Symposium Session entitled “Innovative Information Communication Technologies for Future Network System Supporting Information-oriented Industry” as one of the seven Symposium Sessions hosted by IEICE Communications Society.

The technical committee on NS has started providing the complete English Session since 2005, in order to promote the globalization of IEICE. The English Session provides a good opportunity to both researchers staying in Japan and researchers overseas to make presentations and deep discussions in only English.

In this year, 38 papers were presented at a single track during the whole of four-days conference period. Table 1 and Fig. 1 show the history of the Session.

2. Topics and Statistics

The papers were classified into 10 sub-sessions based on the topics. The sub-sessions were held every day during the IEICE General Conference. In each sub-session, a wide range of topics related with innovative technologies such as wireless networks like MIMO/LPWA, sensor networks, network architecture represented by CCN/DTN, network virtualization represented by SDN/NFV, Web applications, QoS management, traffic modeling, and others were actively discussed among the attendees every day.

Fifteen to forty attendees in the General Conference joined each sub-session, and discussed with speakers. The discussions between speakers and attendees were very active and they exchanged opinions between each other in detail (Fig. 2). Since the time assigned to question-and-answer periods was relatively limited, they frequently continued discussion here and there even during the break periods.

3. Conclusion

In the 2018 IEICE General Conference at Tokyo Denki University in Tokyo, Japan, the NS English Session was very successful thanks to many excellent papers and active discussions. The organizer believes that this activity is fruitful for all participants and is contributing on the globalization of IEICE. In addition,

Table 1 NS English Session in the Past Three Years

Year	Theme
2016	Advanced Networking Technologies for Innovative Information Networks
2017	Advanced Technologies in Communication, Networking, and its Innovative Application for Future Information Network Society
2018	Innovative Information Communication Technologies for Future Network System Supporting Information-oriented Industry

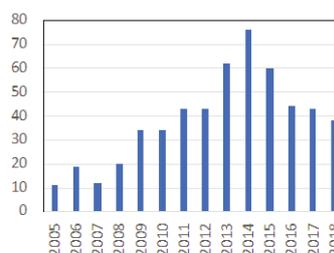


Fig. 1 Number of submissions for NS English Session



Fig. 2 State of NS English Session

several papers are selected to win the NS English Session Awards in each year in order to encourage their continuous activities [2].

However, the number of submissions is continuously decreasing in recent years, as shown in Fig. 1. The main objective of the English Session is to prepare a valuable place where the researchers can stay in only English during the whole of the conference period, but it would become to be difficult to achieve the objective in the near future if the number kept decreasing. Therefore, the technical committee on NS plans to encourage Japanese students to have presentations in this English Session as a first step to submitting their research results to the international conferences.

Finally, we would like to give special thanks to Prof. Yoshiaki Tanaka, for great contributions to the devoted invitation activities utilizing his nation-wide academic authorities and human relations.

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Report on 34th IN/NS Research Workshop

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1. Introduction

The 34th IN/NS Research Workshop took place in Miyazaki, Japan, on March 1, 2018. The workshop was sponsored by the IEICE Communications Society, the technical committee on Information Networks (IN), and Network Systems (NS) of the IEICE Communications Society. The workshop’s aim was to discuss the technical direction and research topics for Financial Technology (Fintech). A record showing of 152 participants testified to the success of the workshop (Fig. 1). The overall theme was “Information technology makes the financial system innovative”. The workshop featured one invited talk session and one panel session.



Fig. 1 Audience-filled hall

2. Invited Speakers

The general chair of the workshop, Prof. Katsunori Yamaoka (Tokyo Institute of Technology), invited 5 distinguished experts in digital currency, block chain, tax revenue system, banking system, and settlement system (Fig. 2). These speakers addressed the information technologies such as the block chain, the security of operation, and the Multi-access Edge Computing (MEC) for the financial system. Figs 3 to 7 show photographs of the speakers.

- Assoc. Prof. Hitoshi Okada (National Institute of Informatics) presented the new trends of the smart economy driven by the digital currency.



Fig. 3 Invited speaker: Assoc. Prof. Okada



Fig. 2 Opening speech of the workshop Prof. Yamaoka

- Prof. Shigeichiro Yamasaki (Kindai University) presented the tutorial of the block chain mechanism, its advantageous architecture for the inter-bank transfer, and a new approach for block chain economy.



Fig. 4 Invited speaker: Prof. Yamasaki

- President Toru Asami (Advanced Telecommunications Research Institute International) presented the network and/or protocol solutions for tax payment system in the Cryptocurrency era.



Fig. 5 Invited speaker: Pres. Asami

- Mr. Yuichi Aoyagi (NTT Data) presented the history of the banking systems, and also introduced their future trends with the collaboration of the Fintech.



Fig. 6 Invited speaker: Mr. Aoyagi

- Mr. Ryosuke Nomura (NTT Data) presented the change of settlement environment from the macro point of view, and then introduced new trends of settlement system from the view point of the market/the payment terminal for the digital economy era.



Fig. 7 Invited speaker: Mr. Nomura

3. Panel Session

After the invited talks, the panel session was held. The session was moderated by the general chair, Prof. Yamaoka. All of the above invited speakers were invited as panelists. In this session, the trends, the future visions, and the challenges of the Fintech innovated by the information technology were discussed.

4. Conclusion

This year's workshop invited key persons to speak on the Fintech innovated by the information technology. The audience filled the hall as shown in Fig. 1. We believe that the presentations given by the invited speakers and the subsequent panel discussion provided fruitful insight into research and development.

The technical committee on NS and IN plans to hold next year's workshop in March 2019. Finally, we would like to express our gratitude to the workshop committee members, particularly to Yousuke Yoshiura (NEC Corp.), Yuta Kobayashi (TOSHIBA Corp.), Satoru Nishimaki (FUJITSU LABORATORIES Ltd.), Yuji Ohishi (Hitachi, Ltd.), Takeshi Suehiro (Mitsubishi Electric Corp.), Hirofumi Noguchi, and Shingo Kashima (NTT Corp.) who made this workshop possible.

Activities of Technical Committee on Healthcare/Medical Information Communication Technology (TC-MICT)

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Niigata University



1. Introduction

This article reports on the activities of technical committee on healthcare/medical information communication technology (TC-MICT) in FY 2017. The TC-MICT was launched as an ad-hoc technical committee in 2006 and established as a regular technical committee in 2014 by the leadership of Prof. Ryuji Kohno, YNU. The TC-MICT is one of newly-born committees in the IEICE communication society, representing a broad range of academia and healthcare/medical industries and covering a wide area from fundamental ICTs to regulatory science for various healthcare/medical applications.

The TC-MICT usually organizes five regular technical conferences per year. The committee members including medical doctors, nursing technicians, and hospital staffs as well as ICT engineers attend the technical meetings and discuss various related issues to share exact information of the needs and seeds for healthcare/medical applications. The TC-MICT also organizes various invited lectures by professionals in healthcare/medical field and joint meeting with various related institutions such as the society of instrument and control engineers (SICE), Japanese society for medical and biological engineering (JSMBE), the Japan association of IT healthcare, and IEEE EMBC.

The administrative staffs (the 2nd period: FY 2016-2017) are as following.

- Chair: Masaru Sugimachi (National Cerebral and Cardiovascular Center)
- Vice Chairs: Shinsuke Hara (Osaka City Univ.), Takahiro Aoyagi (Tokyo Inst. of Tech.)
- Secretaries: Minseok Kim (Niigata Univ.), Eisuke Hanada (Saga Univ.)
- Assistants: Takumi Kobayashi (Yokohama National Univ.), Shintaro Izumi (Kobe Univ.), Tomoko Tateyama (Hiroshima Inst. of Tech.), Ami Tanaka (Ritsumeikan Univ.), Daisuke Anzai (Nagoya Inst. of Tech.)

2. Regular Technical Conferences

The 1st technical conference was held in May 11-12 in Tokyo which was jointly organized by technical committee on reliable communication and control (RCC), where 9 (2 invited, and 7 regular) papers were presented. The invited talk entitled by “Signal

processing of electroencephalogram and brain-machine interfacing -- To overcome "small data" problems” was delivered by Prof. Toshihisa Tanaka (TUAT). He presented various interesting recent results on brain-computer interfaces.



Fig. 1 Invited lecture of the regular conference in May by Prof. Toshihisa Tanaka (TUAT)



Fig. 2 Award ceremony (left: Prof. Masaru Sugimachi, right: Mr. Yuki Ichikawa (Niigata Univ.))

The 2nd technical conference was held in July 13-14 in Hamamatsu city which was jointly organized by technical committee on wideband systems (WBS) where the joint poster session was held as usual and active discussion and technical exchange was successfully made. 15 (9 posters, and 6 regular) papers were presented.

The 3rd technical conference was held in Nov. 6 in Takamatsu city which was jointly organized by

technical committee on medical imaging (MI) where 15 (1 invited, and 14 regular) papers were presented.

The 4th technical conference was held in Jan. 26 in National Cerebral and Cardiovascular Center, Osaka where 10 regular papers were presented. After the regular session, the special event for activation of technical committee, “healthcare/health/medical/bio technical group exchange session.” which was aimed at mutually understanding the research interests of each technical committee and strengthening future cooperation. The session was organized as

- Invited speakers
 - Prof. Masaru Sugimachi (National Cerebral and Cardiovascular Center), TC-MICT
 - Prof. Masao Taki (TMU), TC-EMCJ
 - Prof. Yusuke Kozawa (Ibaraki Univ.), TC-WBS
 - Prof. Shinsuke Hara (Osaka City Univ.), TC-RCC
 - Prof. Kazuki Nakajima (Toyama Univ.), TC-MBE
 - Prof. Hirokazu Takahashi (Tokyo Univ.), SICE Life Engineering
- Invited talk

Prof. Masafumi Kitakaze (National Cerebral and Cardiovascular Center): “Clinical research by data mining”

The 5th technical conference was held in Mar. 16 in Tokyo again which was jointly organized by technical committee on electromagnetic compatibility (EMCJ) where 15 (2 invited and 13 regular) papers were presented.

The detail information is available at Table 1.

3. Research Awards

The MICT research awards were granted to 2 students selected among 45 candidate papers submitted to MICT regular conferences in last year. The award ceremony was held at the society conference venue in September (Fig. 2).

The winners are as following.

- MICT research award

Takuya Sakai (Nagoya Inst. Tech)
“Performance Evaluation of Image Transmission for 10-60 MHz-Band Implant Communications”
- Young researcher award

Yuki Ichikawa (Niigata Univ.)
“An Investigation of Body Motion Identification Method using Radio Channel Characteristics for BAN Context-Aware Communications”

4. Closing Remarks

This article reported on the activities of the TC-MICT in FY 2017. As reported, the TC-MICT was successfully settled playing an important role of technical outreach for healthcare/medical workers as well as exploiting a new interdisciplinary area.

The 1st regular conference will be held in May 24-25 at Tokyo Big Sight, simultaneously with wireless technology park (WTP2018) which is one of the most famous wireless communication technology related exhibitions. In this conference, an interactive poster session will be organized with RCC. Looking forward to seeing you in WTP2018.

Table 1 Regular technical conferences of TC-MICT in FY 2017

Date	Venue	Joint TC	Number of papers	Number of participants
May 11-12	Japan Society for the Promotion of Machine Industry, Tokyo	Reliable communication and control (RCC)	9 (2 invited and 7 regular papers)	30
July 13-14	Act City Hamamatsu, Hamamatsu City	Wideband systems (WBS)	15 (9 poster and 6 regular papers)	40
Nov. 6	Sunport Hall Takamatsu, Takamatsu City	Medical imaging (MI)	15 (1 invited and 14 regular papers)	40
Jan. 28	National Cerebral and Cardiovascular Center, Osaka	-	10	30
Mar. 16	Japan Society for the Promotion of Machine Industry, Tokyo	Electromagnetic Compatibility (EMCJ)	15 (2 invited and 13 regular papers)	50

Report on Japan-Africa Conference on Electronics, Communications, and Computers 2017 (JAC-ECC2017)

Osamu Muta (Kyushu University)
Secretary, CS Technical Committee



1. Introduction

Japan-Africa Conference on Electronics, Communications, and Computers 2017 (JAC-ECC2017) was held on December 18-20th, 2017 at Hilton Alexandria Green Plaza, Alexandria, Egypt, organized by international collaboration between Kyushu University in Japan and Egypt-Japan University of Science and Technology (E-JUST) in Egypt [1]. The conference was technically co-sponsored by Technical Committee of Communication Systems in IEICE Communications Society (IEICE-CS), and IEEE Egypt Section. The conference is supported by Japan Society for the Promotion of Science (JSPS) and the Science and Technology Development Fund (STDF) as bilateral joint seminar program between Japan and Egypt.

As an international conference in the fields of electronics, communications, and computer engineering, JAC-ECC stands out among other conferences in the engineering field, offering its unique value. The conference features formulation of academic and human network among international researchers from academia and industry in Japan, the Middle East, and Sub-Saharan Africa. This year, more than 70 participants including 15 from Japan attended the conference. Other participants joined from Egypt, Libya, Pakistan, Canada, United Arab Emirates and South Africa.

In this report, we briefly explain historical background and overview of JAC-ECC2017 while introducing its special invited session on information communications technologies (ICT) in Japan, co-organized by IEICE-CS and JAC-ECC committee.

2. JAC-ECC History and Overview

In 2012, Kyushu University and E-JUST co-organized an international conference called Japan-Egypt Conference on Electronics, Communications and Computers (JEC-ECC). Since then it was held four times in total: one of them in Japan (Fukuoka in 2015) and the rest in Egypt (2012, 2013, and 2016). Most articles presented in JEC-ECC have been published in the IEEE Xplore online library of the Institute of Electrical and Electronics Engineers (IEEE).

As an advanced edition of JEC-ECC, a renewed international conference, JAC-ECC was organized in 2017. Unlike the previous four conferences,



Fig. 1 Keynote talk

JAC-ECC (with “A” for Africa in place of “E” for Egypt) was organized as a platform for extending collaboration among international researchers in Japan and Middle-East/African countries.

JAC-ECC includes three main technical tracks as follows:

- Communication Systems (CS)
- Digital, Analog and Microwave Systems Design and Implementation (DAMS)
- Computer Networks, Hardware and Software Engineering (CNHS)

The submitted papers are peer-reviewed in two categories. In the first category, all papers accepted by peer review are published on IEEE Xplore online library. In the second category, the conference accepts manuscripts in the form of two-page extended abstract.

Although they are not to be published online, extended abstracts are reviewed similarly to other papers. This is because the main objective of the second category is to provide an opportunity for students and researchers to submit their work-in-progress and receive feedback from experts in favor of improving their work. It also enables cultivation and promotion of students’ research interests in electronics, information and communication engineering fields.

JAC-ECC technical program committee (TPC) has been supported by experts in the field of electronics, communications and computers, contributing to the peer-review process. The reviewers are from Belgium, Canada, Ecuador, Egypt, India, Indonesia, Iran, Japan, Malaysia, New Zealand, Nigeria, Zambia, Saudi Arabia, South Africa, South Korea, Sweden, and United States.

In JAC-ECC2017, the technical program committee received 100 submissions; 88 papers and 12 extended abstracts. All articles were peer-reviewed by international TPC members.



Fig. 2 (a) Poster session (b) Oral session



Fig. 3 Organizing committee members and participants

Among the submissions, 43 papers and 3 posters were accepted with 46 % acceptance ratio. The accepted papers were published on IEEE Xplore similarly to other international conferences in the same research field. Furthermore, we invited five keynote speakers who are leading researchers in engineering fields (Fig. 1) in addition to the technical sessions (Fig. 2). Fig. 3 shows organizing committee members and participants at the conference.

3. IEICE Special Invited Session

A special invited session on ICT technologies in Japan was co-organized by IEICE-CS and JAC-ECC committees. In this session, we invited six outstanding Japanese researchers who are members of IEICE and experts in ICT. Impressive invited talks from academia and industry presented topics such as 5th-generation optical and wireless access, Internet-of-Things (IoT) technologies, software-defined network, and network controls [2-7] as well as brief introduction of IEICE activities. Each presentation had 25 minutes for talk and 5 minutes for questions. Invited presenters in the special session were as follows (Fig. 4)

- Prof. Tetsuya Miki (Univ. of Electro-Commun.)
- Prof. Fumiyuki Adachi (Tohoku University)
- Dr. Ken-Ichi Suzuki (NTT Access Network Service Systems Laboratories)
- Prof. Yukitoshi Sanada (Keio University)
- Prof. Hideki Tode (Osaka Prefecture University)
- Prof. Tetsuya Yokotani (Kanazawa Inst. of Tech.)

During the conference, we had IEICE booth for advertising our activities. We received many queries from participants with regard to how to join IEICE.

4. Conclusion

Next edition of the conference, JAC-ECC2018, is scheduled to be held at either Cairo or Alexandria in Egypt. Call-for-papers for JAC-ECC2018 will be released soon. Please visit our conference site for

further information at the following URL. We welcome your submission to the conference.

<https://sites.google.com/a/ejust.kyushu-u.ac.jp/jac-ecc-2018/>



(a) Prof. Miki (b) Prof. Adachi (c) Dr. Suzuki



(d) Prof. Sanada (e) Prof. Tode (f) Prof. Yokotani

Fig. 4 Presenters in IEICE special invited session

5. Acknowledgment

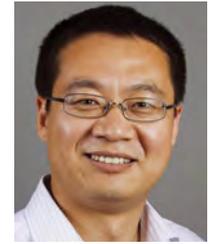
JAC-ECC 2017 was supported by JSPS/STDF Japan-Egypt Research Cooperative Program [8]. We thank Ms. Asaki Haraguchi for her support with improving the quality of written English.

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Report on the 23rd Asia-Pacific Conference on Communications (APCC2017)

Defeng (David) Huang
General Co-Chair, APCC 2017
Professor, The University of Western Australia



1. Introduction

The 23rd Asia-Pacific Conference on Communications (APCC2017) was held in Perth, Australia from December 11 to 13, 2017. Perth is one of the most isolated cities in the world, and is truly unique. For the past 12 years, APCC2017 was the only international conference on communications in Perth. With the theme “bridging the metropolitan and the remote”, the conference program included four keynote speeches, eight invited plenary talks, one workshop keynote speech, one special oral session, four poster sessions, and one workshop on Wireless Communications with Energy Harvesting and Wireless Power Transfer. APCC2017 was organized by the University of Western Australia, financially sponsored by Huawei Technologies, Curtin University, the University of Western Australia, and the Perth Convention Bureau, and technically co-sponsored by the IEEE Western Australia Section, IEICE Communications Society, KICS (Korea Information and Communications Society), and CIC (China Institute of Communications). It was attended by 168 researchers and engineers mostly from the Asia-Pacific region.



Fig. 1 The HON Alannah MacTiernan MLC gave the opening speech

2. Opening Ceremony, Keynote Speeches, and Invited Plenary Talks

On 11 December, the conference started in the Auditorium of the University Club of Western Australia, with welcoming addresses from Prof. Roberto Togneri (Head, Department of Electrical, Electronic & Computer Engineering, the University of Western Australia), Prof. Sven Nordholm (General Co-Chair of APCC2017, Curtin University), Prof. Tony Lucey (Curtin University), Prof. Cesar Ortega-Sanchez

(General Co-Chair of APCC2017, Chair of the IEEE WA Section, Curtin University), and Prof. You-Ze Cho (President of KICS, Kyungpook National University). Technical Program Committee (TPC) statistics were reported by Prof. Wei Zhang (TPC Co-Chair of APCC 2017, The University of New South Wales).

Following the welcoming addresses, two prominent speakers delivered keynote speeches. Prof. Daehyoung Hong gave a speech titled “PS-LTE, LTE-R, and LTE-M Networks for Public Safety”, and Prof. Xuemin (Sherman) Shen gave a speech titled “Automated Driving and Connected Vehicles”. Prof. Zhisheng Niu (TPC Co-Chair of APCC 2017, Tsinghua University) and Dr. Tomohiko Taniguchi (TPC Co-Chair of APCC 2017, Fujitsu Lab Ltd) chaired the keynote session.

On 12 December, the HON Alannah MacTiernan MLC (WA government Minister for Regional Development; Agriculture and Food; Minister assisting the Minister for State Development, Jobs and Trade) gave an opening speech. Before her speech, Prof. Peter Davis (Pro-Vice Chancellor (Research), UWA) gave a brief introduction to the Minister.



Fig. 2 Prof. Adachi gave a keynote speech

Following the opening speech by the Minister, two prominent speakers delivered keynote speeches. Prof. Fumiya Adachi gave a speech titled “Wireless Challenges for 5G Mobile Broadband Communications”, and Mr. Jianmin Lu gave a speech titled “5G - the Road to a Super Connected World”. Prof. Wei Zhang chaired the keynote session.

On 11 and 12 December, there were also four plenary sessions, in which eight invited speakers (Tim Davidson, Jianwei Huang, Dong In Kim, Yang Yang, Takaya Yamazato, Rui Zhang, Feifei Gao, and Jian Song) gave talks.



Fig. 3 Prof. Yamazato was answering a question from the audience

On the second day, the workshop session was held in Seminar Room 2. In the workshop, Prof. Bruno Clerckx delivered a keynote speech, titled “Towards A Signal Theory for Wireless Transmission of Information and Power”.

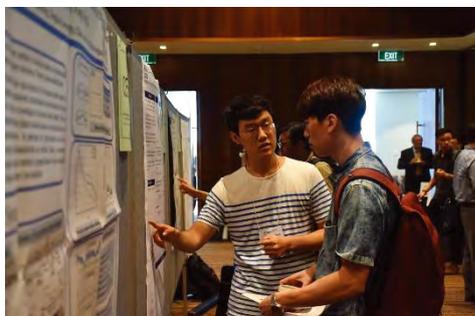


Fig. 4 A corner of one of the poster sessions



Fig. 5 A corner of the Banquet

3. Poster Sessions, Special Oral Session, Sundowner and Banquet

The Technical Program Committee received 184 paper submissions, and accepted 138 papers (including 8 invited papers and 9 workshop papers) through a careful peer review process. To encourage exchanging ideas among researchers (in particular between senior researchers and junior researchers), most presentations were presented in the four poster sessions located in the 18 m x 18 m Banquet Hall of the University Club of Western Australia. On the first day of the conference, there was a special oral session with five presentations in Seminar Room 2.

On the evening of December 11, there was a sundowner on the terrace of the University Club of

Western Australia. The Banquet was held at Maltida Bay Restaurant, and best paper awards were presented to award recipients in the Banquet.



Fig. 6 Prof. Hong, Prof. Zhang and Prof. Yoo with one best paper award recipient



Fig. 7 Scenery of Matilda Bay after dolphins and black swans went to sleep

4. Technology Visit to Katanning Research Facility

On 13 December, some APCC 2017 delegates attended the technology visit to the Katanning Research Facilities located about 277 km South East of Perth. Demonstrations of technologies used in KRF research projects were presented by staff from the Department of Primary Industries and Regional Development.



Fig. 8 APCC2017 participants enjoyed a moment at Katanning Sheep Saleyards (the largest of undercover sheep selling complex in the southern hemisphere) during the Technology Visit to KRF

5. Conclusion

As other APCC conferences, APCC2017 has successfully facilitated research collaboration in the Asia-Pacific region. The next such forum, APCC2018 will be held from November 12 to 14, 2018 in Ningbo, China.

Drafting Future Skies - EIWAC2017

Shigeru Ozeki

Electronic Navigation Research Institute



1. Introduction

The fifth ENRI International Workshop on ATM/CNS (EIWAC 2017) was held at the Congress Square Nakano, Nakano, Tokyo, Japan from November 14th to 16th, 2017, in cooperation of communication society of IEICE. After successful meetings in 2009, 2010, 2013 and 2015, ENRI organized this conference with its theme as “Drafting Future Skies” [1].

2. EIWAC

This workshop focused on the research and development of modern air traffic management (ATM) and its enabling technology in Communication, Navigation and Surveillance (CNS). This workshop will contribute to the global harmonization of activities by air traffic control (ATC) service providers, industry, researchers and all other stakeholders such as airspace users. EIWAC is the unique forum which has participants with wide divergence in their discipline, in strategic layers from political strategy to R&D, and in geographical areas in 4 continents where they are working.

Leading experts from research, industry and academia met at the technical sessions in this workshop to share their recent results in R&D projects. In addition, opinion leaders in strategy to implement future ATM systems held the key note speeches, and participants enjoyed this chance to think about conformance of their business or R&D strategy with very high level policy, for example, in the International Civil Aviation Organization. In total, 630 participants from 13 countries enjoyed 5 keynote speeches, 1 lecture in tutorial session, 64 oral presentations and 9 posters. 3 technical exhibitions became agendas to discuss among participants. EIWAC becomes global workshop as well as presentations by Japanese researchers were only 20 in 79 presentations, i.e., about a quarter.

ENRI thanks following institutes for their support to EIWAC2017. The workshop is kindly promoted by EUROCAE who is an international body working on international standards on ATM and CNS. Air navigation service providers like as Japan Civil Aviation Bureau (JCAB), Federal Aviation Authority (FAA), and French civil aviation authority (DGAC/DSNA) also supported and interested. The office of Collaborative Actions for Renovation of Air Traffic Systems (CARATS), the Japanese council for actions toward future ATM, also supported EIWAC2017. Academic institutes like Japan Society for Aeronautical and Space, Science (JSASS) kindly

coordinated to avoid conflicts of schedules among many events or conferences. Logos from Research institutes and Universities such as French Civil Aviation University (ENAC), Japan Aerospace Exploration Agency (JAXA) are also found with indicating their kind supports to this workshop.

In preparation for EIWAC2017, the members for technical program committee, Mr. Mohamed Faisal Bin Mohamed Salleh (ATMRI), Prof. Low Kin Huat (ATMRI), Mr. Jean-Marc Loscos (DSNA, French Air Navigation Service Provider), Mr. William C. Johnson (NASA), Dr. Masatoshi Harigae (JAXA) and Terumitsu Hirata (Ibaraki Univ.) made great contributions to review and assign papers for technical sessions with considering the activation of discussion on site.

3. Plenary Sessions

EIWAC2017 started with the opening address by Prof. Hiroyuki Yamato, the president of National Institute of Maritime, Port and Aviation Technology in which ENRI was merged with keeping its name (Fig. 1).



Fig. 1 Opening Session by Prof. H. Yamato

The plenary sessions with following the opening are organized for keynote speeches to provide a forum for exchanging opinions on future air traffic managements and to introduce the demands and requirements from airspace users to project managers and researchers.

All keynote speakers indicated the importance of infrastructure for information managements and aeronautical communication which will contribute to improve the performance of ATM.

At first, Mr. Stephen P. Creamer, Director, Air Navigation Bureau, International Civil Aviation Organization (ICAO/ANB) presented their schedule to update the Global Air Navigation Plan, GANP, and its road map called Aviation System Brock Upgrades, ASBUs. He emphasized the importance of recognition

by all stakeholders on the new technologies to be introduced with applying the R&D products practically and timely.

Mr. Florian Guillet, Executive Director, SESAR JU, had his presentation to introduce their strategy for future “digital aviation infrastructure” and for modernization of ATM systems in European airspace.

Ms. Pamela Whitley, Assistant Administrator for NextGen, FAA, also indicated the importance of aeronautical communication in her presentation titled “Aviation: A Global Digital Journey.”

Mr. Yasuhiro Iijima, Director of Air Navigation Services Department, Japan Civil Aviation Bureau presented on the future plan for renovation of ATM/CNS systems in Japan.

Mr. Masahiro Kudo, Director General, ENRI, introduced recent outputs and outcomes after the research work such as enhancement of function and capacity of Airport. And, he also reported some difficulties by the reduction of investment to ATM modernization with comparing those in 20 years ago.

Participants enjoyed the chance for discussions with these opinion leaders after each presentation.

4. Invited Talks

Mr. Patrick Souchu (EUROCAE) presented the merit of contributing to the international standardization with reducing the risk of misleading projects in each company or country. The meetings for standardization always estimate the demands and requirements for 20 years later, and the estimations will become common understandings by industry in most case.

Mr. Paul Bosman, Head of ATM Strategies Division, EUROCONTROL, presented their strategy to introduce systems for SWIM, System Wide Information Management. He also used the keyword “fully digitized ATM” in his presentation.

Mr. Satoshi Kogure, Executive Director for QZSS Development, National Space Policy Secretariat, the Cabinet Office, Japan, introduced Japanese space-based Positioning, Navigation and Timing, PNT, system, QZSS, and its services and applications. EIWAC becomes a chance to promote Japanese implementation of aeronautical navigation system for near future.

5. Tutorial Session: Airspace Design Optimization

Prof. Daniel Delahaye, ENAC, lectured on the mathematics to optimize solutions for designing airspace structure. This is his second time to have tutorial session at EIWAC with following that in 2013.

6. Special Sessions

Special sessions were organized for EIWAC2017 with focusing the areas of Ground Based Augmentation System (GBAS), SWIM, space weather and future radio technologies.

7. Technical Sessions

Various themes are set to discuss in each session. For example, “Trajectory Managements”, “ATM Performance”, “Airport Management”, “Traffic Capacity and Congestion Management”, “UAS”,

“ATM Modeling”, “Aviation Safety” and “CNS Systems”.

8. What Is Next?

EIWAC2017 provided a forum to discuss on ATM/CNS and a chance to exchange with opinion leaders in future civil aviation. It is very rare chance in the Asia/Pacific region. ENRI is now working on papers to edit a book for selected papers of EIWAC2017 like as past EIWACs [2, 3].

The next EIWAC will be scheduled in 2019 or so with hoping that our activity will provide researchers with the chance to exchange their results in air traffic management, communication, navigation and surveillance related studies and to recognize the demands and requirements on what and how to provide research results.

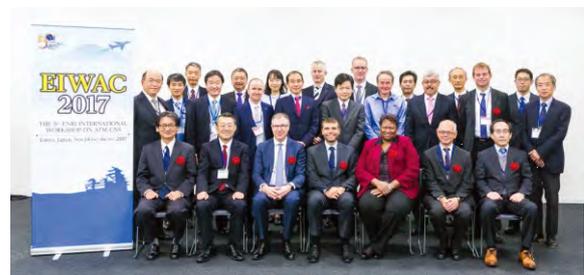


Fig. 2 EIWAC2017 Keynote Speakers, TPC members and guests from DLR and JCAB

9. References

- [1] ENRI, “Abstract of EIWAC2017 Presentations,” November, 2017.
- [2] ENRI ed., “Air Traffic Management and Systems - Selected Papers of the 3rd ENRI International Workshop on ATM/CNS (EIWAC2013),” ISBN 978-4-431-54474-6, Springer Japan, 2014.
- [3] ENRI ed., “Air Traffic Management and Systems II - Selected Papers of the 4th ENRI International Workshop on ATM/CNS (EIWAC2015),” ISBN 978-4-431-56421-8, Springer Japan, 2017.

Report on 2017 IEEE Conference on Antenna Measurements & Applications (2017 IEEE CAMA)

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[‡]Secretary of 2017IEEE CAMA, AIST



1. Introduction

This article reports on the 2017 IEEE International on Antenna Measurement and Applications (2017 IEEE CAMA) that was held at the National Institute of Advanced Industrial Science and Technology (AIST) in Tsukuba, Japan, during 4-6 December, 2017. Tsukuba is not only a beautiful city but also the largest science technology accumulation city, where more than 300 public and private institutes and companies are located. 2017 IEEE CAMA was the fourth IEEE Antennas and Propagation Society Topical Meeting on Antenna Measurement and Applications. It was financially sponsored by the IEEE Antennas and Propagation Society. For enhancing the conference, 2017 IEEE CAMA was technically sponsored by the IEICE Technical Committees on Antennas and Propagation (AP) in Communication Society and AIST.

2. Brief History of IEEE CAMA

The first IEEE CAMA was held in Antibes Juan-les-Pins, France, during 16-19 November, 2014. The second IEEE CAMA was held in Chiang Mai, Thailand, during 30 November-2 December, 2015. The third IEEE CAMA was held in Syracuse, N.Y., USA, during 23-27 October, 2016. In this fourth IEEE CAMA, Dr. Satoru Kurokawa (AIST, Japan) and Prof. Nozomu Ishii (Niigata Univ., Japan) served as General Chairs, and Qiang Chen (Tohoku Univ., Japan) served as General Co-Chairs.

This conference offered researchers and engineers to share their latest advances in all areas related to antenna measurements in controlled and non-controlled (in-situ) environments, antenna testing, electromagnetic measurement techniques including systems considerations, and all relationships of these areas to applications.

3. Technical Sessions

The technical session was started after the opening ceremony (Fig. 1). The technical program of 2017 IEEE CAMA consisted of 3 keynote speeches, 22 oral sessions and 1 poster session. In the keynote session, the following speeches were presented (Fig. 2);

- Prof. Yahya Rahmat-Samii (University of California, Los Angeles, USA), “The Art and Engineering of Antenna Near-Field Measurements

and Diagnostics: History, Fundamentals and Future”

- Prof. Tapan Sarkar (Syracuse University, USA), “Planar Near Field to Far Field Transformation Using an Equivalent Current Approach that Employs No Probe Correction”
- Prof. Jiro Hirokawa (Tokyo Institute of Technology, Japan), “Rectangular Coordinate Orthogonal Multiplexing Antenna System for Non-Far Region Communication”

Total number of registered participants reached 155. The statistics for paper submission, acceptance, and registration are summarized in Table 1.

The presented papers covered a wide range of unique and novel technical topics on antenna measurements and applications (Fig. 3, 4).



OPENING CEREMONY

Program	Speaker/Chair
1. Opening Ceremony	Secretary of IEEE CAMA 2017 Prof. Takashi Hikage
2. Keynote Speech	Professor Yahya Rahmat-Samii, IEEE Antennas and Propagation Society Prof. Amey J. Ghosh
3. Keynote Speech	Director of Antenna Components Dept. Prof. Daisuke Sakai / Prof. Naoki Yoshida
4. Keynote Speech	Technical Committee Chair Prof. Takayuki Sakamoto
5. Closing	Secretary of IEEE CAMA 2017

Fig. 1 Opening Ceremony

Table 1 Major Statistics

Submitted Papers	136
Accepted Papers	130
Registered Papers	123 (Oral:101, Poster:22)

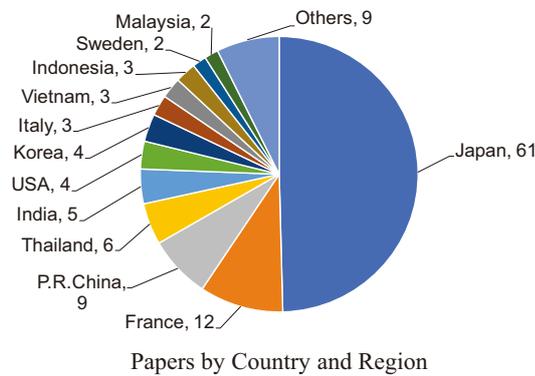


Fig. 3 Technical Session

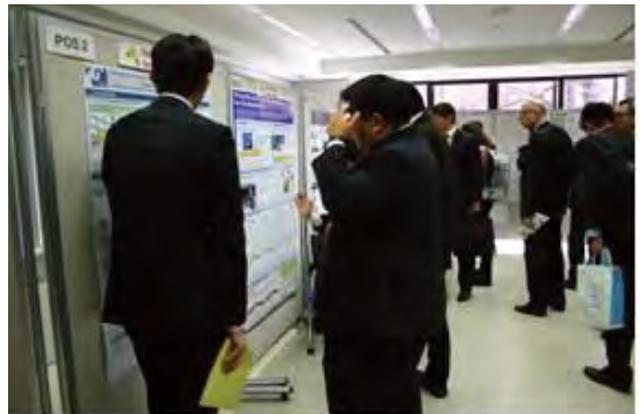
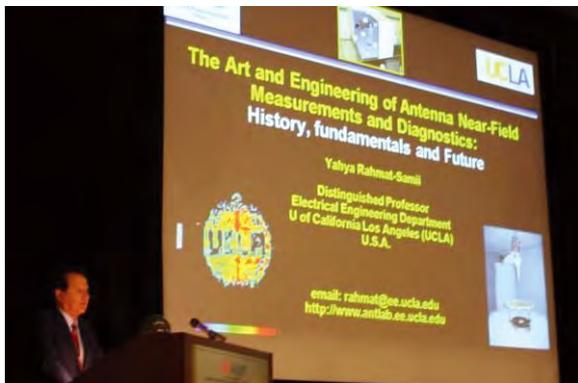


Fig. 4 Poster Session



(a) Prof. Yahya Rahmat-Samii



(b) Prof. Tapan Sarkar



(c) Prof. Jiro Hirokawa
Fig. 2 Keynote Speeches

4. Awards

The IEEE CAMA2017 hosted “IEEE Ulrich L. Rohde Innovative Conference Paper Awards on Antenna Measurements and Applications,” and “Student Paper Awards.”

Based on the evaluation results of the submitted papers, technical program committee selected two excellent papers as “IEEE Ulrich L. Rohde Innovative Conference Paper Awards on Antenna Measurements and Applications.” Also, technical program committee selected 3 Student Paper Awards from the applicants as “Student Paper Award Finalists.” (Table 2) The all winners were announced at the banquet.

Table 2 Awards Winner

Ulrich L. Rohde Award	
Zhong Chen (ETS-Lindgren, USA), Zubiao Xiong (ETS-Lindgren, Inc., USA) "Investigation of Deconvolution Filters for High Resolution Time-Domain Antenna Measurements – A numerical study"	
Motoyuki Sato (Tohoku University, Japan) "2-D and 3-D Near Range SAR Imaging"	
Student Paper Award	
Van Hieu Nguyen "Wireless interrogation of small animal phantoms with a miniature implanted UHF RFID tag"	
Tomihiko Ikegami "Design of Frequency Selective Surface by Matrix Transformation of Layer Structure to Reduce Return Loss of Thick Dielectric Plate"	
Naoki Kanada "Vector Signal Generation by Optical Frequency Doubler for MMW Train Communication Systems"	

5. Banquet & Social Program

As a social event, the welcome reception was held at the first night, and delightful banquet party was held at the Okura Frontier Hotel Tsukuba in the evening of the 2nd day. The participants enjoyed delicious Japanese cuisine as well as exceptional show, “Bull Frog's Oil Sale = Gama no Abura Uri” and music performance, “Japanese drums” in the banquet (Fig. 5).

On the 3rd day, guided tour to JAXA's test facilities was held as social program. JAXA Tsukuba Space Center is in the neighborhood area of AIST. Operational spacecraft testing facilities were introduced through the tour.



Fig. 5 Banquet

6. Future Plan

The next IEEE CAMA will take place in Västerås, Sweden, from 3 to 6 September 2018. It will be organized by Mälardalen University. We hope to see you all in Västerås! [2]

7. References

- [1] <http://www.2017ieeecama.org>
- [2] <http://www.2018ieeecama.org>

IEICE-CS Related Conferences Calendar

Date	Conference Name	Location	Note
28 Jul. – 2 Aug. 2019	IEEE International Geoscience and Remote Sensing Symposium 2019 (IGARSS 2019)	Yokohama, Japan	TBD
7 Jul. – 11 Jul. 2019	The 24 th Opto-Electronics and Communications Conference / International Conference on Photonics in Switching and Computing 2019 (OECC / PSC2019)	Fukuoka, Japan	Submission due: 2 February 2019
3 Jun. – 7 Jun. 2019	2019 Joint International Symposium on Electromagnetic Compatibility and Asia-Pacific International Symposium on Electromagnetic Compatibility, Sapporo (EMC Sapporo & APEMC 2019)	Sapporo, Japan	TBD
20 May – 23 May 2019	International Conference on DC Microgrids (ICDCM2019)	Matsue, Japan	TBD
6 Nov. – 9 Nov. 2018	2018 Asia-Pacific Microwave Conference (APMC 2018)	Kyoto, Japan	Submission deadline: Closed
23 Oct. – 26 Oct. 2018	2018 International Symposium on Antennas and Propagation (ISAP2018)	Busan, Korea	Submission deadline: Closed
22 Oct. – 24 Oct. 2018	2018 IEEE 7 th International Conference on Cloud Networking (CloudNet2018)	Tokyo, Japan	Submission deadline: Closed See page 45
17 Oct. – 19 Oct. 2018	International Conference on Information and Communication Technology Convergence 2018 (ICTC2018)	Jeju Island, Korea	Submission due: 30 June 2018 See page 44
14 Oct. – 17 Oct. 2018	International Conference on Renewable Energy Research and Applications (ICRERA2018)	Paris, France	Submission due: 6 June 2018
19 Sep. – 20 Sep. 2018	Topics on Secure Architectures (TOSAR 2018)	Iasi, Romania	Submission due: 20 July 2018 See page 43
29 Aug. – 31 Aug. 2018	2018 IEEE International Workshop on Electromagnetics: Applications and Student Innovation Competition (iWEM 2018)	Nagoya, Japan	Submission due: 4 June 2018
4 Jul. – 7 Jul. 2018	The Tenth International Conference on Ubiquitous and Future Networks (ICUFN 2018)	Prague, Czech Republic	To be held soon
2 Jul. – 6 Jul. 2018	The 23 rd Opto-Electronics and Communications Conference (OECC 2018)	Jeju Island, Korea	To be held soon
3 Jun. 2018	Technology Trials and Proof-of-Concept Activities for 5G and Beyond 2018 (TPoC5G 2018)	Porto, Portugal	To be held soon
20 May 2018	The 11 th International Workshop on Evolutional Technologies & Ecosystems for 5G Phase II (WDN-5G ICC2018)	Kansas City, USA	Done
18 Dec. – 20 Dec. 2017	Japan-Africa Conference on Electronics, Communications and Computers 2017 (JAC-ECC 2017)	Alexandria, Egypt	Reported on this issue
11 Dec. – 13 Dec. 2017	The 23 rd Asia-Pacific Conference on Communications (APCC 2017)	Perth, Australia	Reported on this issue
4 Dec. – 6 Dec. 2017	2017 IEEE International Conference on Antenna Measurements & Applications (2017 IEEE CAMA)	Tsukuba, Japan	Reported on this issue
14 Nov. – 16 Nov. 2017	The fifth ENRI International Workshop on ATM/CNS (EIWAC 2017)	Tokyo, Japan	Reported on this issue

Please confirm with the following IEICE-CS web site for the latest information.

<http://www.ieice.org/cs/conf/calendar.html>

Special Section Calendar of IEICE Transactions on Communications

Issue	Special Section	Note
Aug. 2019	Technology Trials and Proof-of-Concept Activities for 5G and Beyond	Submission due: 7 September 2018 See page 38
Jul. 2019	Communication Technologies and Service Qualities in Various Access Networks	Submission due: 1 August 2018 See page 37
Jun. 2019	Healthcare, Medical Information and Communication Technology for Safe and Secure Society	Submission due: 2 July 2018 See page 36
May 2019	European ICT R&D Project Activities on Broadband Access Technologies in Conjunction with Main Topics of 2016/2017 IEICE ICT	Submission due: 7 June 2018 See page 35
Apr. 2019	Sensing, Wireless Networking, Data Collection, Analysis and Processing Technologies for Ambient Intelligence with Internet of Things	To be issued
Mar. 2019	Network Virtualization and Network Softwarization for Diverse 5G Services	To be issued
Feb. 2019	Recent Progress in Antennas and Propagation in Conjunction with Main Topics of ISAP2017	To be issued
Jan. 2019	No special section this issue	
Dec. 2018	No special section this issue	
Nov. 2018	No special section this issue	
Oct. 2018	Wireless Distributed Networks for IoT Era	To be issued
Sep. 2017	No special section this issue	
Aug. 2018	Autonomous Decentralized Systems Technologies and Approaches Innovation through Structure Change of Society and Life	To be issued soon
Jul. 2018	Communication Quality in Wireless Networks	To be issued soon
Jun. 2018	No special section this issue	
May 2018	No special section this issue	
Apr. 2018	Optical Access System for Social Life	Vol. E101-B, No. 4

Please confirm with the following IEICE web site for the latest CALL FOR PAPERS
<http://www.ieice.org/event/ronbun-e.php?society=cs>

Call for Papers

----- Special Section on European ICT R&D Project Activities on Broadband Access Technologies in Conjunction with Main Topics of 2016/2017 IEICE ICT Forum -----

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on European ICT R&D Project Activities on Broadband Access Technologies in Conjunction with Main Topics of 2016/2017 IEICE ICT Forum" in the 2019 issue (**May 2019**).

The special section is organized by IEICE Europe Section. As the growth of wireless services continues, improved and new transmission technologies, system and network architectures and their socio-economic implications are being investigated in order to accommodate the increasing user demand for ease of scalability and reliable broadband service. The special section seeks for submission particularly from, but not limited to, the authors of the IEICE ICT Forum, and will focus on both theoretical and practical aspects of new algorithms, network/system design and architectures, performance analysis, and experimental studies, related to the technical fields of European ICT R&D Projects.

1. Scope

Topics of the special section include research results from European ICT R&D project activities or related ones for, but are not limited to the following areas:

- Information and communication theory and algorithms,
- 5G and beyond wireless cellular networks/wireless cooperative networks/wireless cognitive and reconfigurable networks, and related technologies,
- Socio-economic implications of new technologies, law/regulatory impacts of new network technologies, social networking,
- The Internet of Things and machine type communications,
- Next-Generation Access (NGA) technologies and networks: Integration of optical and wireless access as a last mile,
- Converged optical-wireless networks,
- Power line communication technologies, future broadband digital subscriber line (DSL) access,
- Distributed monitoring and management techniques, channel modeling/measurement,
- Performance measurements, experimental platforms and testbeds concerning to the above mentioned topics.

2. Submission Instructions

The standard number of pages is 8. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guideline in the "Information for Authors." The latest version is available at the web site, http://www.ieice.org/eng/shiori/mokuji_cs.html. The term for revising the manuscript after acknowledgement of conditional acceptance for this special section could be shorter than that for regular issues (60 days) because of the tight review schedule.

This special section will accept papers only by electronic submission. Submit a manuscript and electronic source files (LaTeX/Word files, figures, authors' photos and biographies) via the IEICE Web site https://review.ieice.org/regist/regist_baseinfo_e.aspx by June 7th, 2018 (JST). Authors should choose the European ICT R&D Project Activities as a "Journal/Section" on the online screen. Do not choose [Regular EB].

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----- Special Section on Healthcare, Medical Information and Communication Technology for Safe and Secure Society -----

The IEICE Transactions on Communications announces that it will publish a special section entitled "Healthcare, Medical Information and Communication Technology for Safe and Secure Society" in **June 2019**.

The cyber-physical systems bring new societies with a rapid development of the Information and Communication Technology (ICT), and there are several efforts to fit such societies in the world. The trials are projected as the Industry 4.0 in Germany, the Industrial Internet in the US, and the Made in China 2025. Japan has a project named the Society 5.0 which aims to construct a safe and secure society. One of the big issues in the Society 5.0 is an extension of healthy-life expectancy. Then, healthcare / medical innovation applying ICT is highly desired. Furthermore, healthcare / medical ICT provides a new paradigm to research and development areas due to innovative integration between medicine and engineering. Healthcare / medical ICT has been widely recognized as an emerging area in a biomedical engineering research field. For achieving safe and secure society through dependable healthcare / medical services, it is necessary to rapidly develop fundamental core technologies of the healthcare / medical ICT from various aspects such as sensors, devices, big data, communication networks, robotics and regulatory science.

To bring the safe and secure society with healthcare / medical ICT research field, the special section is planned to publish papers on the related fields.

1. Scope

This special section aims at timely dissemination of research in these areas. Possible topics include, but are not limited to:

- devices and systems for healthcare / medical ICT (wireless sensor network, communication system, antenna, etc.)
- big data management for healthcare / medical system (data aggregation, management and application, etc.)
- robotics and actuator technologies for healthcare / medical equipment (remote control, communication, location, etc.)
- regulatory science for healthcare / medical device authentication

2. Submission Instructions

The standard number of pages is 8. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guideline in the "Information for Authors." The latest version is available at the web site, http://www.ieice.org/eng/shiori/mokuji_cs.html. The term for revising the manuscript after acknowledgement of conditional acceptance for this special section could be shorter than that for regular issues (60 days) because of the tight review schedule.

This special section will accept papers only by electronic submission. Submit a manuscript and electronic source files (LaTeX/Word files, figures, authors' photos and biographies) via the IEICE Web site https://review.ieice.org/regist/regist_baseinfo_e.aspx by **July 2, 2018 (JST)**. Authors should choose the Healthcare, Medical Information and Communication Technology for Safe and Secure Society as a "Journal/Section" on the online screen. Do not choose [Regular EB].

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----- Special Section on Communication Technologies and Service Qualities in Various Access Networks -----

The IEICE Transactions on Communications announces that it will publish a special section entitled “Special Section on Communication Technologies and Service Qualities in Various Access Networks” in the **July 2019** issue.

The progress of the research and development on high-capacity communication networks and sophisticated communication devices enables a variety of network services to be provided anytime and anywhere. In addition to various communication systems and networks, their assessment, measurement, design, management, control, and optimization methodologies are key technologies for future network services and applications. The communication environment is drastically changing with the emergence of big data, artificial intelligence (AI), augmented reality (AR), and virtual reality (VR) technologies. In preparation for network environment satisfying diversified demands for communication qualities in access and user-area networks, we have to develop not only individual technologies for communication systems, services, or applications but also their cross-cutting and cooperative technologies in consideration of user behaviors. Because of such reasons, a special section is being planned (scheduled to appear in the July 2019 issue) to further promote research and development on communication technologies and service qualities in various access networks.

1. Scope

The scope of this special section includes not only communication technologies and qualities but also their multidisciplinary researches for access and user-area networks. Possible topics include, but are not limited to:

- access network technologies
(optical/wireless access, optical-wireless integration, cross layer, signal processing, virtualization, and security)
- quality of service (QoS) and quality of experience (QoE)
- reliability and energy-saving technologies in network services
- assessment, measurement, design, management, control, and optimization methodologies
- network services and applications
- subjective and objective quality assessments of voice, audio, video, and haptic media
- incentive, user utility, and user behavior in networks services
- QoS for IoT/M2M, edge/fog computing, and smart city

2. Submission Instructions

The standard number of pages is 8. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guideline in the “Information for Authors.” The latest version is available at the web site, http://www.ieice.org/eng/shiori/mokujii_cs.html. The term for revising the manuscript after acknowledgement of conditional acceptance for this special section could be shorter than that for regular issues (60 days) because of the tight review schedule.

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Call for Papers

— Special Section on Technology Trials and Proof-of-Concept Activities for 5G and Beyond —

IEICE Transactions on Communications announces that it will publish a special section entitled “Special Section on Technology Trials and Proof-of-Concept Activities for 5G and Beyond” in the August 2019 issue.

To the beginning of the service in 2020, technology trials and proof-of-concept are undergoing for the 5th generation mobile communication system (5G). In the 5G standardization, key enabling technologies such as massive MIMO, beamforming, access technology and a new frame design are to be specified. Meanwhile, the research and development of those key technologies and their technology trials are being carried out in many research entities. On the other hand, new technology concepts for beyond 5G (B5G) have been also investigated. In these regards, this special section is aiming to provide the opportunity to present the latest trials and trial results for 5G and the proof-of-concept activities for B5G.

1. Scope

This special section aims at timely dissemination of research in the following areas. Possible topics include, but are not limited to:

- Validation of technology for the 5G systems
- Hardware implementation issues of the 5G systems
- Proof-of-concept activities for the B5G systems
- Radio interface design
- New waveform design
- Massive MIMO techniques
- Small cell technologies
- Advanced modulation and coding schemes
- Advanced retransmission control
- Advanced multiple access technologies
- Advanced interference coordination and mitigation techniques
- Advanced MIMO technologies
- Advanced technologies for flexible duplex
- Capacity/coverage split system design
- Energy-efficient radio access technologies
- Technologies for higher frequency bands
- Technologies for massive connectivity
- Technologies for small packet transmission
- Technologies for ultra-low latency
- Device to device (D2D) communications
- Wireless fronthauling and backhauling
- Advanced relay
- Advanced multiple radio access technologies
- System concept and architecture
- Heterogeneous access networks

2. Submission Instructions

The standard number of pages is 8. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guidelines in the "Information for Authors." The latest version is available at the web site, http://www.ieice.org/eng/shiori/mokuji_cs.html. The term for revising the manuscript after acknowledgement of conditional acceptance for this special section could be shorter than that for regular issues (60 days) because of the tight review schedule.

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IEICE Welcome to the IEICE Overseas Membership Page URL:<http://www.ieice.org/>

Membership for Overseas Candidates: Overseas Members may opt to join **one IEICE Society of their choice** and may request to receive the **IEICE Transactions of online version** of that Society. Furthermore, Overseas Members may request to receive the IEICE Journal (written in Japanese) and Transactions (published in paper) at an additional cost. Similar services are available to **Overseas Student Members**. Voting privileges in the IEICE election do not apply to Overseas Members. Note that the Overseas Membership applies only to candidates who reside outside of Japan and who have citizenship in countries other than Japan.

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● IEICE Societies and Publications

Society	Transactions	Editorial Subject Indexes
A (Fundamentals of Electronics, Communications and Computer Sciences)	EA (English) A (Japanese)	Engineering Acoustics, Noise and Vibration, Speech and Hearing, Ultrasonics, Digital Signal Processing, Analog Signal Processing, Systems and Control, Nonlinear Problems, Circuit Theory, VLSI Design Technology and CAD, Numerical Analysis and Optimization, Algorithms and Data Structures, Graphs and Networks, Reliability, Maintainability and Safety Analysis, Cryptography and Information Security, Information Theory, Coding Theory, Communication Theory and Signals, Spread Spectrum Technologies and Applications, Mobile Information Network and Personal Communications, Intelligent Transport System, Image, Vision, Computer Graphics, Language, Thought, Knowledge and Intelligence, Human Communications, Neural Networks and Bioengineering, Multimedia Environment Technology, Communication Environment and Ethics, Concurrent Systems, Measurement Technology, General Fundamentals and Boundaries
B (Communications)	EB (English) B (Japanese)	Fundamental Theories for Communications, Devices/Circuits for Communications, Transmission Systems and Transmission Equipment for Communications, Optical Fiber for Communications, Fiber-Optic Transmission for Communications, Switching for Communications, Switching for Mobile Communications, Network, Network Management/Operation, Internet, Wireless Communication Technologies, Terrestrial Radio Communications, Satellite Communications, Optical Wireless Communications, Antennas and Propagation, Electromagnetic Compatibility (EMC), Sensing, Navigation, Guidance and Control Systems, Energy in Electronics Communications, Terminals for Communications, Multimedia Systems for Communications, Broadcast Systems, Integrated Systems for Communications, Space Utilization Systems for Communications
C (Electronics)	EC (English) C (Japanese)	Electromagnetic Theory, Lasers, Quantum Electronics, Optoelectronics, Microwaves, Millimeter-Waves, Ultrasonic Electronics, Electronic Circuits, Electronic Materials, Organic Molecular Electronics, Electronic Components, Electromechanical Devices and Components, Semiconductor Materials and Devices, Integrated Electronics, Electron Tubes, Vacuum and Beam Technology, Electronic Displays, Superconducting Electronics, Storage Technology, Electronic Instrumentation and Control
D (Information and Systems)	ED (English) D (Japanese)	Computation and Computational Models, Automata and Formal Language Theory, Algorithm Theory, Complexity Theory, Computer Components, VLSI Systems, Computer Systems, Fundamentals of Software and Theory of Programs, System Programs, Software Engineering, Database, Contents Technology and Web Information Systems, Data Mining, Networks, Dependable Computing, Application Information Security, Distributed Cooperation and Agents, Artificial Intelligence and Cognitive Science, Human-computer Interaction, Office Information Systems, e-Business Modeling, Educational Technology, Rehabilitation Engineering and Assistive Technology, Pattern Recognition, Speech and Hearing, Image Processing and Video Processing, Image Recognition, Computer Vision, Computer Graphics, Multimedia Pattern Processing, Natural Language Processing, Biocybernetics, Neurocomputing, Biological Engineering, Music Information Processing, Kansei Information Processing, Affective Information Processing
Journal of IEICE (written in Japanese only)		

● Membership Charges (<http://www.ieice.org/eng/member/OM-appli.html#c>)

Basic Membership Charge is as follows. It will change the term when you join IEICE. Please refer to the above website.

Basic Membership Charge (UNIT : Japanese YEN)

Service coverage for overseas members	Admission charge	Online Version		Paper Version (optional)
		Registration of the first society (includes its online version transactions)	Registration of additional societies (includes its online version transactions)	Journal (written in Japanese)
Member (overseas)	1,400	7,000	3,500 / 1society	6,000
Member (overseas) with OMDP*	1,000	5,000	3,000 / 1society	6,000
Student member (overseas)	-	2,000	2,000 / 1society	6,000
Student member (overseas) with OMDP*	-	1,000	1,500 / 1society	6,000

NOTE

1. You need to choose one Society, and you can subscribe Transactions online of your registered society.

Example: If you want to subscribe to Transaction of EA, please check **Society Registration** as "A", and your membership fee amounts to 7,000 yen / 5,000 yen.

2. If you want to register other Societies and Transaction of web version, please check "Additional Society registration".

Example: If you want to subscribe to Transaction of EA and EB, please check **Society Registration** as "A", **Additional Society registration (optional)** as "B". Your membership fee amounts to 7,000+3,500 yen / 5,000+3,000 yen.

3. If you want to subscribe to one Transaction of paper version, please check "Additional Transaction subscription (published in paper)".

Example: If you want to subscribe to Transaction of EC in paper version additionally, please check **Society Registration** as "A", and **Additional Transaction subscription (in paper version)** as "C" or as "EC". Your membership fee amounts to 7,000+4,000 yen / 5,000+4,500 yen.

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Areas	Air mail	SAL mail
Asia; Guam; Midway islands	5,600 yen	3,200 yen
Oceania; Near & Middle East; North & Central America; Europe	7,800 yen	4,400 yen
Africa; South America	11,000 yen	5,600 yen

Please contact the IEICE Membership Section: E-mail:member@ieice.org FAX: +81 3 3433 6659 Please fill out the application form printed on the next page.

**IEICE-CS Overseas Membership with Special Annual Fees
for Sister Society Members**

To foster the cooperation between the Sister Society and the IEICE Communications Society (IEICE-CS), the Sister Society agreement enables members of each institution to become members of both societies by granting special annual fees.

A 10% - 20% discount* of the annual fees will be granted to the sister society members to become the IEICE-CS overseas members. The discounted fees will be applied for the individual members when the new membership is starting or the current membership is renewing.

* The discount does not apply to the optional items and services i.e. “Additional Society”, “Additional Transactions of paper version” and “Rapid Mailing Service”.

----- Please send the following Sister Society membership information, together with membership application form in the next page. -----

Sister Society membership information

To apply discount rates for this IEICE-CS Sister Society member’s application, please indicate your Sister Society Membership number below, and attach a copy of your Sister Society Membership certificate or card to this form.

Sister Society: IEEE ComSoc KICS VDE-ITG

Membership number (Member): _____

Copy of Membership certificate or Membership card:

(Attached here)

From Editor's Desk

● Season's greetings

IEICE Society Conference 2018 will be held at Kanazawa University, Kanazawa City, from 11th to 14th September 2018. Complete English sessions are also scheduled in the conference to promote globalizations of IEICE's academic activities. Kanazawa City is located on the Sea of Japan in the middle area of Japan. The city is a castle town developed around Kanazawa Castle. You will be able to enjoy the mood of the long history and the culture of the city. Please consider submitting a paper to the conference. Paper submission deadline is 4th July 2018. Please check out the latest conference information on the IEICE web site at:

http://www.toyoag.co.jp/ieice/E_S_top/e_s_top.html

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Topics on Secure Architectures

TOSAR 2018

September 19-20, 2018, Iasi, Romania

Symposium organized by

“Gheorghe Asachi” Technical University of Iasi,

in cooperation with

IEEE SSGS-037 (Romanian Chapter) and IEICE-CS (technical cosponsor)

Important dates

- ◆ Proposal for tutorials: **May 25, 2018**
- ◆ Paper submission deadline: **July 20, 2018**
- ◆ Notification of acceptance: **August 31, 2018**
- ◆ Symposium days: **September 19-20, 2018**

Topics

- ◆ Hardware implementations for Security
- ◆ Cryptographic primitives and protocols
- ◆ Computer and Information Security

Private partners: AT&C Technology SRL



Contact: office@tosar.org

ICTC 2018 THE 9TH INTERNATIONAL CONFERENCE ON ICT CONVERGENCE

“ICT Convergence Powered by Smart Intelligence”

October 17-19, 2018 | Jeju Island, Korea



CALL FOR PAPERS

ICTC is the unique global premier event for researchers, industry professionals, and academics interested in the latest developments in the emerging industrial convergence centered around the information and communication technologies (ICT). More specifically, it will address challenges with realizing ICT convergence over the various industrial sectors, including the internet infrastructures and applications in wireless & mobile communications, smart devices & consumer appliances, mobile cloud computing, green communication, healthcare and bio-informatics, and intelligent transportation. The conference is organized by KICS. The conference will include plenary sessions, technical sessions, and invited industrial sessions. Accepted papers will be published in the proceedings with an assigned ISBN number. You are invited to submit papers in all areas of internet infrastructures, services, technologies, and applications for ICT convergence.

RELATED TOPICS:

Potential topics in this conference include, but are not limited to:

- Wireless & Mobile Communication Systems and Infrastructure
- 5G, 4G, LTE, LTE-Advanced, WLAN, WPAN, WBAN
- Communication Networks and Future Internet Technologies
- Information & Communication Theory, and Their Applications
- Mobile Cloud Computing & Communication Systems and Applications
- Smart Media & Broadcasting, and Smart Devices/Appliances
- Green Communication Technologies and Solutions
- Energy Internet, Smart Grid Infrastructure and Applications
- Maritime Communications Systems & Networks
- Vehicular Information and Communication Technologies
- u-Healthcare Systems, and Bio-informatics & Its Applications
- Military and Defense Technologies
- SDN and Network Virtualization
- CCN/CDN/ICN/Delay-tolerant networks
- Public Protection & Disaster Relief (PPDR) Communication
- Internet of Things (IoT) and Web of Objects (WoO)
- Machine-to-Machine (M2M) and D2D Communications
- Encryption and Security for ICT Convergence
- Mobile S/W and Data Science
- Big Data and Its Applications
- Artificial Intelligence and Machine Learning
- Other Services and Applications for ICT Convergence

SUBMISSIONS:

ICTC 2018 invites the submission of original, unpublished research work (including position papers) that is not currently under review elsewhere. Authors may submit either a 6-page full paper for selected journal publication or a 3-page short paper via <https://edas.info/N24658>. The submissions should be formatted with single-spaced, two-column pages using at least 10 pt (or higher) size fonts on A4 or letter pages. The maximum number of pages is 6 for full papers and 3 for short papers. Please make sure that both full papers and short papers must be at minimum 3 pages in length. Detailed formatting and submission instructions will be available on the conference web site (<http://ictc.org> or <http://www.ictc2018.org>).

KEYNOTE SPEAKERS and SPECIAL TALKS:

During ICTC 2018, Keynote Speeches and Special Talks will be delivered by high level VIPs and prominent speakers from ETRI, Qualcomm, Intel, Samsung Electronics, LG Electronics, Microsoft, Cisco, Huawei, LG U+, KT, SKT, and so on.

CALL FOR WORKSHOP PROPOSALS:

Proposals are invited for half-day or full-day workshops in the areas of communications, networks, or other ICT-related topics. For any inquiries on workshops, please contact at ictc@kics.or.kr.

PRESENTATION:

The accepted paper will be presented either in an oral session or poster session. All accepted papers will appear in the ICTC 2018 proceedings only if at least one of the authors attends the conference to present the paper.

JOURNAL PUBLICATION:

Extended versions of selected papers will be invited for publication in SCI-indexed journals such as Journal of Communications and Networks, ETRI Journal, Int'l Journal of Distributed Sensor Networks, Springer Peer-to-Peer Networking & Applications Journal, and other journals including ICT Express [Scopus], Information Journal [Scopus], and KICS Journal after an express review and further revisions.

BEST PAPER AWARDS:

ICTC 2018 will present the Best Paper Awards to the authors of selected outstanding papers.

IMPORTANT DATES

- Paper Submission Deadline: **June 30, 2018**
- Notification of Acceptance: **August 18, 2018**
- Camera Ready Deadline: **September 1, 2018**
- Author Registration Deadline: **September 1, 2018**

For any inquiries on ICTC 2018, please contact ictc@kics.or.kr

Call for Participation



Cloud Networking has emerged as a promising direction for cost-efficient and reliable service delivery across data communication networks. The dynamic location of service facilities and the virtualization of hardware and software elements are stressing the communication network and protocols, especially when datacenters are interconnected through the Internet. Emerging Network Function Virtualization (NFV) and Software Defined Network (SDN) can play significant roles by improving the dynamicity and programmability of cloud networks. Middlebox has been significantly improved the agility of cloud network deployment and management. The 7th IEEE International Conference on Cloud Networking (IEEE CloudNet 2018) can greatly promote researches in cloud network and emerging research areas.

Topics of Interest (but not limited to)

Cloud network and resource management

- Data Center Network Optimization and Management
- Reliability of Data Center Network and Architecture
- Energy-Efficient Datacenters and Networks
- Cloud Traffic Characterization and Measurements
- Cloud Traffic Engineering and Control-Plane Architectures
- Data Flow Management and Load Balancing
- Cloud computing and cloud storage
- Energy-Efficient Datacenters and Networks

Cloud network and virtualization

- Data Center Networks
- Virtual Ethernet Switching, Data Center Bridging
- Green Data Centers and Cloud Networking
- Mobile Cloud Networking
- Virtualization of Network Equipment
- Software-Defined Networking
- Network Function Virtualization
- Middleware and Middleboxes

Cloud network and supported services

- Big Data Management
- Data Analytics in Cloud
- Network Services to support IaaS, PaaS, and SaaS
- Unified User and Machine Mobility Management
- Content and Service Distribution in Multilocation
- Complementing Edge Computing with Data Center Networks

Cloud network architecture

- Distributed Data Center Architectures
- Internet Routing of Cloud data
- Intra-Cloud vs Inter-Cloud Management
- Cloud Federation and Hybrid Cloud Infrastructure

Cloud network security and privacy

- Security, Privacy, and Confidentiality in Cloud Networking
- Cloud data provenance and data loss protection
- Cloud storage security
- Cloud network intrusion detection/prevention
- Distributed firewall in cloud and DPI

Prospective authors are invited to submit original technical papers using the EDAS links <http://edas.info/N24505>. Submissions must be in IEEE single-spaced double-column style with a length limitation of 6 pages (including title, abstract, all figures, tables, and references) for full papers (oral presentation) and 3 pages for short papers (poster presentation). Accepted papers will be submitted to IEEE Xplore.

For more information, please check

<http://cloudnet2018.ieee-cloudnet.org>

Important Dates

Paper Submission:	May 15, 2018
Acceptance Notification:	Aug. 12, 2018
Camera Ready due:	Aug. 30, 2018
Conference:	Oct. 22 – 24, 2018

Keynote Speakers

Larry Peterson, Open Networking Foundation, USA
Manu Gosain, Northeastern University, USA
Masahisa Kawashima, NTT, Japan

General Co-Chairs:

Akihiro Nakao, The University of Tokyo, Japan
Tarik Taleb, Aalto University, Finland

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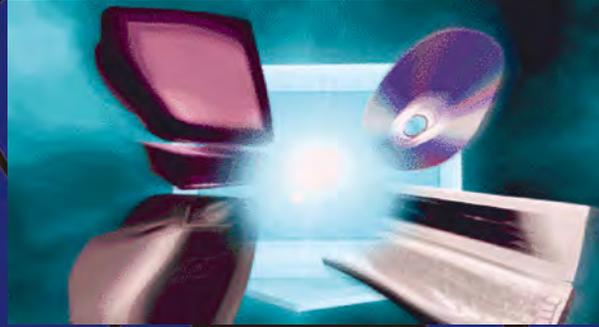
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To Probe Further and Keep Up-to-date with Communication Technologies

IEICE Communications Society



IEICE Society Conference 2018

11–14 September 2018

Kanazawa University, Kanazawa

Every autumn, each Society organizes a Society Conference to provide a forum where members can present their study results and exchange views. At present, four of the Societies -- the Engineering Sciences Society, the NOLTA Society, the Communications Society, and the Electronics Society -- hold their Society Conferences as a joint event. The Communications Society Conference includes English-language sessions in addition to the Japanese-language sessions.

Please check out the latest information on the IEICE web site at:

http://www.toyoag.co.jp/ieice/E_S_top/e_s_top.html

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