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# *IEICE Communications Society* GLOBAL NEWSLETTER *Vol. 41, No.2*
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# Greetings from the New President

Masahiro Morikura
President, IEICE Communications Society
Professor, Kyoto University, Japan

It is my great honor to serve as president of the IEICE Communications Society (IEICE-CS), which is the largest society in IEICE, and a place where many excellent researchers and engineers from academia and industry actively pursue their goals. Specifically, it is the responsibility of IEICE-CS to promote research and development in electronics, information, and communication fields, and also to educate and nurture researchers and engineers. Consequently, it can be said that IEICE-CS fosters vibrant technical committees, and the activities conducted within the society contribute greatly to the progress of research on a global scale. Building on this success, I promise to do my best to further improve IEICE-CS activities and to increase their value for IEICE-CS members.

IEICE has recently reported a decrease in both its number of members and its finances; however, various methods can be employed to rectify this situation and revitalize and enhance the academic activities and technical capabilities of IEICE-CS.

I believe that the strength of IEICE-CS lies in its ability to continuously find means of improving equipment and systems for each new generation of communication technologies; furthermore, it has also proven to be adept in regard to human-resource development, which is consistently conducted, from seniors to juniors, within the society. On the other hand, it seems that the society's power to create new, paradigm-shifting technology is currently insufficient. This form of technology concerns the combination of multiple technical fields and elements to establish new technical fields that are not bound by conventional boundaries. Consequently, it is important for universities and academic societies to cultivate human resources that have the ability to generate and understand such technology. To expand on this last point, I would now like to present three points regarding the qualities that should be instilled in such human resources.

(1) Strong curiosity

In 2005, the book "The World is Flat" by Thomas Friedman included the formula: "CQ (curiosity quotient) + PQ (passion quotient) > IQ (intelligence quotient)." The meaning of this formula is that successful research-and-development engineers possess more curiosity and enthusiasm than ordinary people. In other words, even a person with a high IQ cannot outperform an individual who constantly ponders research subjects and has strong curiosity in their field. In order to foster such human resources, special education systems must be implemented in academic societies; such systems will facilitate the fostering of engineers and researchers who can make remarkable achievements in activities related to science and engineering.

(2) The ability to cope with environmental changes

Dr. Charles Darwin, who advocated the theory of evolution, developed the concept of "survival of the fittest." This concept can also be applied to engineering, as it is a discipline that concerns creating new technologies to solve society's problems. Societal problems change as time passes, and it is not always possible to address these problems using traditional academic frameworks. In order to solve future societal problems, it is necessary to engage in cross-disciplinary activities that transcend clearly divided areas of expertise; consequently, I believe that it is important to promote such activities within IEICE-CS.

(3) Different senses of values

In order to make new discoveries and obtain new knowledge, it is important to interact with people who have different ideas and who are from different fields; globalization facilitates such interactions by making exchanges with overseas researchers and students possible. However, a clear obstacle in regard to creating diversified networks of engineers in IEICE-CS is that there are very few female electric and electronic researchers in the society. As a result, I believe that it is important to encourage and develop more female researchers; after all, half of the consumers of products and services are women. In order to increase the number of female researchers, it is necessary to change various social systems which, unfortunately, is a relatively difficult task.

The three points mentioned above reflect my opinion on the qualities new human resources should possess in order to accommodate the needs of future societies. I would also like to add that I believe that it is important that young people who wish challenge new research fields that cannot be categorized under existing academic systems are not impeded.

I wish to conclude this greeting message by asking all of you to continue to lend your kind support to IEICE-CS activities.

# Medical Applications of Microwave Energy

Kazuyuki Saito
Center for Frontier Medical Engineering, Chiba University

## 1. Preface

Center for Frontier Medical Engineering (CFME) is one of the research centers in Chiba University and was established in 2003 (Fig. 1). A mission of the CFME is development of new medical devices by coordination of engineers and medical doctors. Until now, many medical devices for therapeutics and diagnoses have been created from the CFME. My major field of study is application of electromagnetic wave especially the microwave. So, I have been studying medical applications of microwave energy. In this article, I would like to introduce two examples of them.

## 2. Introduction

In recent years, the quality of life of patients has become increasingly important. Therefore, it is an established fact that medical applications of microwave techniques are important [1] because these applications are effective in reducing the mental and physical burden of patients [2]. These applications are as follows:

1. Thermal treatments, which use microwave energy as a heating source.
2. Information gathering and diagnostic techniques inside the human body that use microwave, such as computerized tomography (CT) and magnetic resonance imaging (MRI).
3. Transmission of patients' medical information.

In relation to point 2, MRI might be one of the diagnostic devices that use an electromagnetic field with the most success at the moment and many relating studies are performed. Transmission of patients' medical information (point 3) is considered to be an extension of communication technologies [3] and has been studied actively by many researchers.

In our laboratory, we have been studying the medical application of microwave energy as a heating source (point 1). In this article, development and performance evaluations of microwave therapeutic devices for the hyperthermia and the surgical devices are introduced.

## 3. Hyperthermia

There are several different ways for cancer treatment including surgical operation, radiation therapy, chemotherapy, gene therapy, immunotherapy, ablation and hyperthermia. Two or more different ways are sometimes combined for clinical use. Hyperthermia is one of the promising modalities for cancer treatment, utilizing the difference of thermal sensitivity between tumor and normal tissue and is one of the most effective medical applications of microwave techniques.

Fig. 1 Logo of the Center for Frontier Medical Engineering. It modeled "CFME".

In this treatment, the tumor is heated up to the therapeutic temperature between 42 and 45 °C without overheating the surrounding normal tissues [4]. In addition, the effect of other cancer treatments such as radiotherapy and chemotherapy can be enhanced by using them together with hyperthermia.

There are several energy sources for heating tumors such as hot water, ultrasound, electromagnetic wave, etc. Microwave energy is one of the heating sources used for localized hyperthermia [5]. The frequency for microwave hyperthermia ranges from several hundred to several thousand MHz (i.e. up to several GHz). For hyperthermia treatments, heating devices using 430 MHz, 915 MHz, and 2.45 GHz have been commercially developed.

The authors have developed coaxial-slot antennas [6], which are used for interstitial microwave heating, and have many experiences of actual clinical treatments in collaboration with medical doctors.

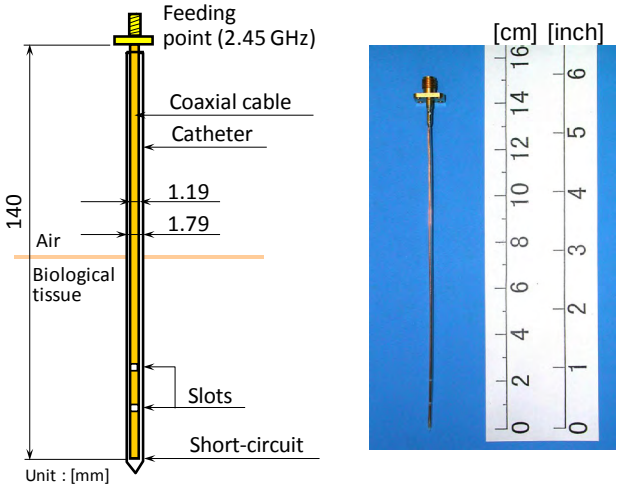


Fig. 2 Basic structure of coaxial-slot antenna

Figure 2 shows basic structure of a typical coaxial-slot antenna. Before a clinical treatment, many types of heating patterns around the antenna were calculated to deal with various shapes of tumors. For example, Fig. 3 shows a calculated temperature distribution around the array applicator composed of four coaxial-slot antennas under some practical assumptions and operating frequency of the antenna is 2.45 GHz, which is one of the industrial, scientific and medical (ISM) frequencies.

Figure 4 shows one of the photographs during the treatment by use of our developed antennas. The treatments have been proceeded by corroboration with Prof. Yutaka Aoyagi at Ichikawa General Hospital, Tokyo Dental College. Until now, several cases of clinical treatments are experienced and effectiveness of the treatments could be confirmed.

## 4. Surgical Device

Generally, electrical scalpels have widely been used for surgical operation. Conventional electrical scalpels utilize radio frequency (RF) current (from hundreds kHz to several MHz) and can realize both tissue coagulation and dissection. However, these devices have some problems. First, the device requires an external electrode which sometimes causes burn injury around it. Moreover, the RF current may go through an unexpected part of the human body, and it may cause involuntary muscle movement. In addition, since the device generates excessively high temperature, biological tissue is carbonized. As a result, fog will be generated. This is a serious problem especially in laparoscopic surgery (Fig. 5).

Massive bleeding during surgical operation could be dangerous for a patient. Especially, laparoscopic surgery cannot be continued under such massive bleeding, because a view of the laparoscope reduces. Therefore, hemostasis is one of the most important treatments. The authors have been studying tissue coagulation devices for hemostasis by using microwave energy. Here, a stick-type device based on helical structure for tissue coagulation and hemostasis is introduced. Figure 6A is the basic configuration of the device tip. Whole helical part is covered with polytetrafluoroethylene (PTFE) material for prevention of tissue adhesion. The operating frequency of the antenna is 2.45 GHz. With a help of medical doctors, the authors have done several animal experiments using swine in our research center. The effectiveness of the device could be confirmed in the living tissue with blood flow. Figures 6B-E are photographs during the animal experiment using developed device.

Moreover, we have been developing “tissue coagulation detection system”. Figure 7A shows the relative permittivities and conductivities of swine liver tissue under various temperatures. The measured frequency is 300 kHz. It turned out that the electric constants change significantly from 60 to 70 °C, at which temperature the thermal denaturation of biological tissues occurs. Therefore, the tissue coagulation can be detected by measurement of the impedance change. Figure 7B also shows the results from stained cell tissues observed by

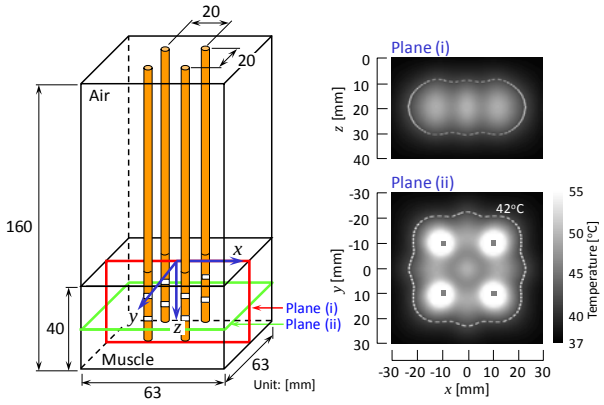


Fig. 3 Example of calculated temperature distributions in human body

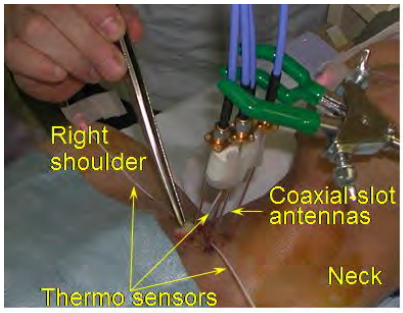


Fig. 4 Clinical treatment by use of developed antennas

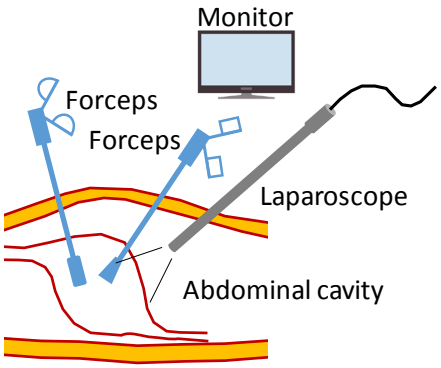


Fig. 5 Laparoscopic surgery

microscope. It is possible to observe the cell nucleus and cell membrane in unheated tissues. By contrast, it seems that the cytoplasm within a cell flows out after cell membrane destruction in tissues heated to 100 °C.

## 5. Summary

In this article, microwave devices for medical treatment, which employ the thermal effect of biological tissue, have been introduced. It is considered that these devices are one of the most effective applications of microwave techniques. It should be emphasized that close cooperation of engineers with medical staffs is quite important. The authors hope the present article will stimulate and encourage microwave engineers to do future research work on medical applications.

## 6. Afterword

We have some study themes other than those listed here. If you are interested, please visit our web site [7].

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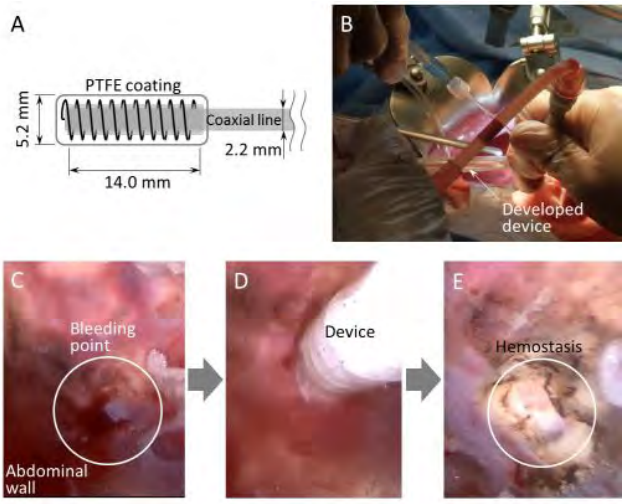


Fig. 6 Microwave surgical device

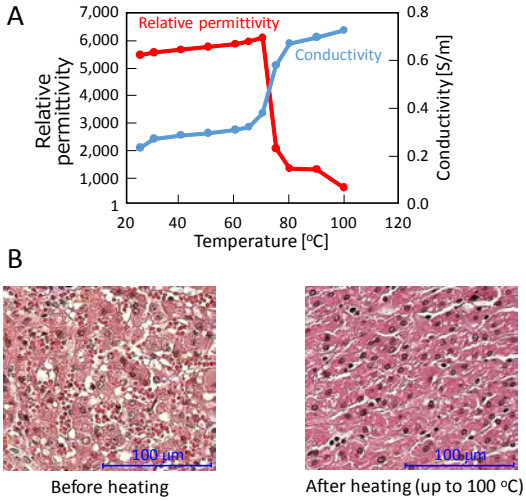


Fig. 7 Detection of tissue coagulation

# RF Signal Processing with Antenna and Microwave Circuit Integration

Ichihiko Toyoda
Saga University

## 1. Introduction

In these days, wireless communication systems such as a cell phone and wireless LAN have become common in our lives. Much higher data rate and larger capacity are strongly required as well as high spectral efficiency. To meet the requirements, many advanced technologies such as the Multi-Input Multi-Output (MIMO) and Orthogonal Frequency Division Multiple Access (OFDMA) have been developed. Meanwhile, Internet of Things (IoT) and Internet of Everything (IoE) are the recent hot topics. In these applications, every device has a wireless connection to the Internet to provide a service that is more sophisticated. Along with the development of the wireless technologies, these applications require multi-function and high-performance microwave and millimeter-wave components.

Classical wireless communication systems use only the time domain parameters such as an amplitude, frequency and phase to carry information. However, the radio wave has spatial domain parameters also, i.e., polarization and direction of propagation. These spatial domain parameters are useful to achieve high-spec and/or simple wireless communication systems for the next generation wireless systems [1,2]. The recent advanced wireless systems utilize a part of the spatial domain parameters. For example, massive MIMO technology, which is one of the most expected technologies of the next generation cell phone systems, i.e. 5G, generates multiple beams and effectively uses the space. However, these systems require power-consuming digital signal processing. Especially, simple and cost effective wireless modules are essential for the IoT/IoE applications. Wireless technologies are also used in radars and wireless power transfer systems as well as the communication and broadcast systems. Therefore, the RF signal processing technology utilizing the characteristics of the electromagnetic wave is expected to realize a simple and advanced transceiver module for many wireless applications.

This article introduces a novel RF signal processing technology and advanced planar antennas developed in Communication Engineering Laboratory, Saga University. The developed antennas effectively utilize the spatial parameters of the electromagnetic waves and provide spatial-parameter control functions, such as a direction-of-arrival (DOA) estimation [3,4], beam steering [5], beam tracking [6] and polarization switching/detection [7-10]. The structure of the antenna is very simple due to the effective use of the both-sided MIC technology, which is the combination of microstrip lines and slot lines. The circuit integrated in the antennas provides RF signal processing functions such as addition, subtraction and multiplication of RF signals. The characteristics of the electromagnetic field are actively used to achieve the advanced microwave and millimeter-wave components.

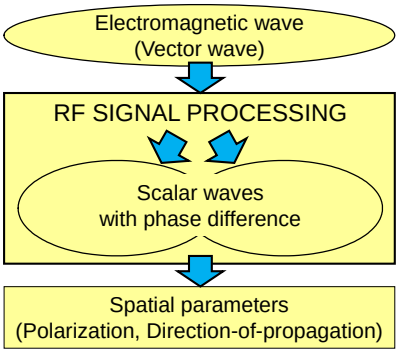


Fig. 1 Basic concept of the RF signal processing

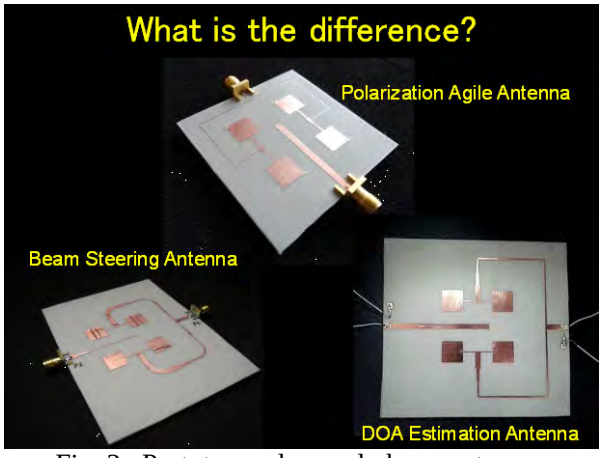


Fig. 2 Prototype advanced planar antennas

## 2. Basic Concept of RF Signal Processing

In classical wireless communication systems, the amplitude, frequency, and phase of the carrier wave are modulated by information. Thus, the signals are treated as a scalar function. However, the actual radio wave has vector parameters such as the direction of the electric and magnetic fields and the direction of propagation. The classical wireless communication systems have not effectively used these spatial parameters. In the recent advanced wireless communication systems, a part of these spatial parameters is used. Polarimetric radars and massive MIMO technology expected in the 5G cell phone

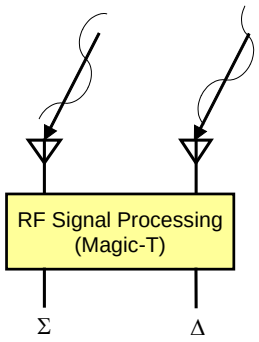


Fig. 3 Basic block diagram of the advanced planar antennas

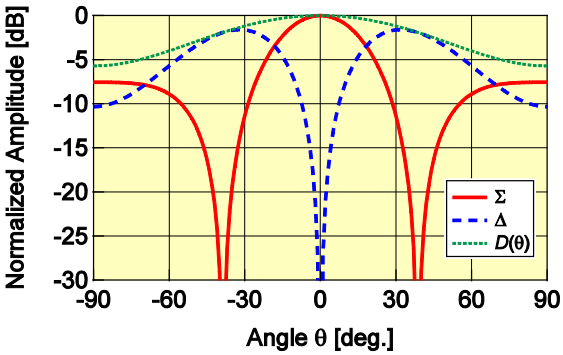


Fig. 4 Theoretical radiation patterns of Σ and Δ signals

systems as well as the conventional polarization diversity are the examples.

Figure 1 shows the basic concept of the RF signal processing. Any vector signals can be decomposed into two or more scalar signals with phase difference. For example, any polarization can be treated as a combination of two orthogonal waves. Therefore, the phase control is essential to utilize the spatial parameters effectively. Magic-Ts and 90-degree hybrids are the effective circuit elements of the RF signal processing.

## 3. Advanced Planar Antenna

Figure 2 shows prototype advanced planar antennas developed in our laboratory. Each antenna provides a respective unique function such as DOA estimation, beam steering or polarization switching even though these antennas look similar.

Figure 3 shows a basic block diagram of the antennas. Two antenna elements are connected to an RF signal processing circuit. Magic-T is one of the most useful RF signal processing circuit. The magic-T was originally developed for waveguide microwave circuits and it is an RF signal combiner/divider with 0- and 180-degree phase difference. Therefore, sum (Σ) and difference (Δ) of the two input signals are obtained by using the magic-T. The magic-T can be also easily realized in a planar structure by effectively using microstrip lines and slot lines formed on both sides of a substrate.

Figure 4 plots theoretical normalized radiation patterns of the Σ and Δ signals in a solid and broke line, respectively. A typical radiation pattern $D(\theta)$ of a single microstrip antenna is also plotted in a dotted line

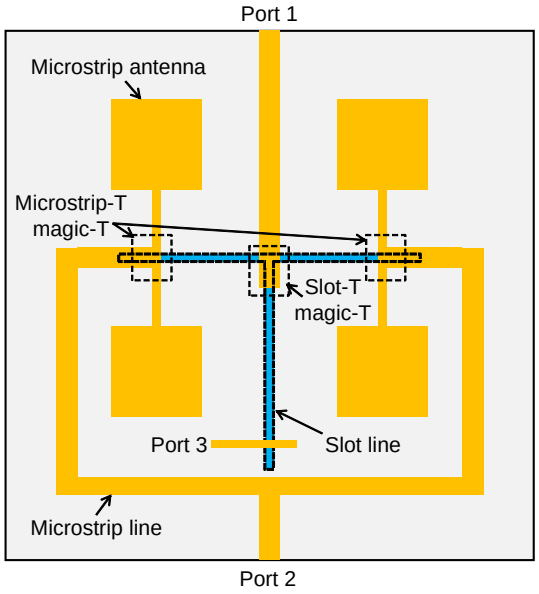


Fig. 5 In-phase/anti-phase triple feed array antenna

as a reference. Many unique functions are realized by effectively using these radiation patterns.

*A. DOA Estimation Antenna* [3,4]

The DOA estimation antenna has two diodes at the Σ and Δ ports of the antenna to detect the sum and difference of the signals received by the two antenna elements. The arrival angle is determined by the amplitude ratio of the Σ and Δ signals according to the monopulse mechanism. This structure is also used as a wide-angle rectenna.

*B. Beam Steering Antenna* [5]

The beam steering antenna provides beam scan function with two orthogonal input signals. Changing the amplitude ratio of the two input signals shifts the main beam direction.

*C. Polarization Agile Antenna* [7]

The polarization agile antenna provides a linear-polarization switching between +/-45 degrees. Diodes are mounted at the corners of each patch element to change the boundary condition of the patch elements. ON/OFF states of the diodes are changed by a bias voltage, i.e., a switching signal. In this antenna, the magic-T is used to separate the low-frequency switching signal and RF signal.

*D. Triple Feed Array Antenna* [11]

Figure 5 shows the structure of the in-phase/anti-phase triple feed array antenna. The antenna employs two types of magic-Ts. One of these is a microstrip-T type magic-T, which is constructed with a microstrip-line T-junction and slot-microstrip line T-junction. The other is a slot-T type magic-T, which is a combination of a slot-line T-junction and microstrip-slot line T-junction. This structure effectively provides unique radiation patterns similar to Fig. 4 in both E- and H-planes of the antenna because the four antenna elements have three different phase relations according to the input ports. This antenna realizes a 2-dimensional beam steering antenna, 2-dimensional DOA estimation antenna and 2-dimensional wide-angle

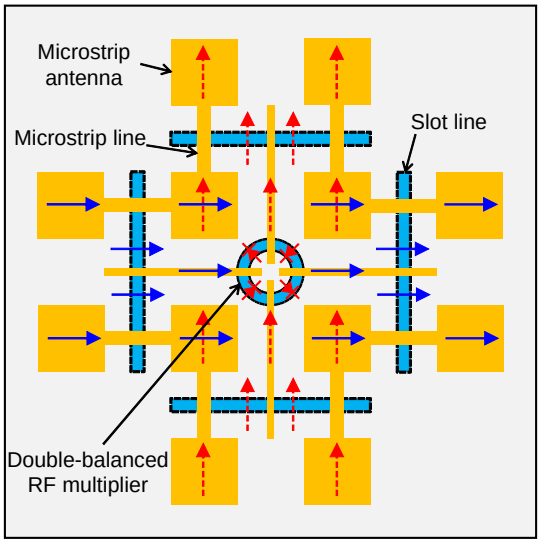


Fig. 6 Polarization detection antenna

rectenna with the same principle of the above-mentioned antennas.

*E. Polarization Detection Antenna* [10]

To realize a communication system using the polarization switching, the polarization has to be detected at the receiver. Effective use of an RF multiplier and dual-polarized antennas achieves simple configurations.

Figure 6 shows the structure of our polarization detection antenna. When +/−45-degree polarized wave is received by the antenna, the received RF wave is divided into two orthogonal components such as horizontal and vertical components. Each component is fed to the double-balanced RF multiplier located at the center of the antenna. The multiplier calculates the product of two orthogonal components in RF. Therefore, this simple structure can demodulate the polarization-modulated RF signal to the baseband signal.

## 4. Other Research Topics

Communication Engineering Laboratory, Saga University also conducts research on a wide range of hardware technologies for wireless applications such as Push-Push oscillators and their application to oscillator arrays, versatile reconfigurable antennas, active antennas integrating a Gunn oscillator, advanced planar rectennas for microwave wireless power transfer and selective wireless transfer employing magnetic resonant coupling. For more information, please visit our website and Facebook [12,13].

## 5. Conclusion

The main concept of Communication Engineering Laboratory, Saga University is harmonized integration of antennas and microwave circuits. This article has introduced a novel RF signal processing technology based on the concept and advanced planar antennas actively utilizing the spatial parameters of the electromagnetic wave. The concept is a promising technology to achieve compact and advanced transceiver modules for the next generation wireless systems, including communications, broadcast, radar and wireless power transfer.

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# Research on Wearable Antennas and Radio Wave Propagation in a Farm

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## 1. Introduction

Nowadays, wireless communication systems are widely and essentially used in our lives. Their technology continues to extend their application fields wider. Body-centric wireless communication and sensor networks for smart agriculture are examples of the applications that are paid much attention in recent years.

This article introduces the recent research activities at Shimasaki Laboratory, Kyoto Institute of Technology. First, flexible antennas made of conductive textiles are introduced, which were designed and fabricated for wearable wireless devices in 2.4-GHz band. Their characteristics in bending cases as well as a flat case were focused. Next, our investigation on radio wave propagation is introduced, which was conducted in a farm for 920-MHz and 2.4-GHz bands. This research is aimed to obtain basic data of the path losses in agricultural environment for estimating link budgets and they are useful for designing wireless sensor network in farms.

## 2. Wearable Antenna Made of Textiles

### 2.1 Flexible Cavity-Backed Slot Antenna

Recent wireless communication equipment is much desired to be compact, even in a wearable style. So, wearable electronic systems have been extensively studied. Examples of the applications include wearable computers, personal health monitoring systems, and sensor networks. Such wireless systems are referred to body-centric wireless communication systems. An antenna used in wearable electronic systems is required to be soft, thin and light. A various kind of antennas using conductive textiles have been reported so far. We have studied cavity-backed slot antennas (CBSAs) using conductive textiles and shown their characteristics of the flat case and the case of being bent.

First, we fabricated a slot antenna backed by a textile cavity in an envelope shape [1]. The side walls of the cavity were also textiles. Then, the CBSA has been revised into that with post-walls [2,3]. Figure 1 shows the slot antenna backed by a post-wall waveguide cavity. We used conductive textiles as the two parallel plates and conductive threads as via posts. So this antenna can be made of flexible material and bent easy. The slot was made by getting rid of the conductive threads in the designed shape. The conductive textiles were created by incorporating silk and conductive threads into fabrics by means of weaving. The conductive threads used in this study included aluminum and were not fine metallic wires or filaments, but made by means of a traditional technology and have been used as ornamental yarn for clothes for hundreds years.

Electromagnetic coupling was used for excitation of the antenna. A feeder line crossed just in front of the slot and then connected to an open-ended microstrip stub line instead of touching the antenna conductor. This method of feeding helped avoid soldering textiles.

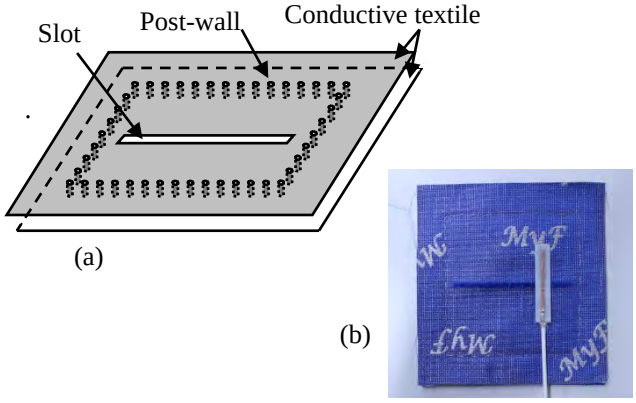
### 2.2 Radiation Patterns in Bending Case

The reflection and radiation characteristics were measured for the flat and bending cases. The roundly bending case was carried out by setting the antenna cavity on the surface of a polystyrene foam in a spherical shape. The radius of curvature was $rc$ = 200 mm.

In the reflection characteristics, the center frequency and the operation band of -10dB reflection were shifted lower by bending, but the shift was so little that it could not affect the operation.

In the measurement of the radiation characteristics, the fabricated CBSA was used as a receiving antenna, and the transmitting antenna was a double-ridged waveguide antenna (Lindgren, model 3115). The distance of the two antennas was 2.5 m, and the frequency was chosen as 2.33 GHz.

The variation in the radiation patterns by being bent are shown in Fig. 2 (a) and (b) for E- and H-plane characteristics, respectively. The microstrip feeder may




(a) Slot antenna backed by a post-wall waveguide cavity
(b) Photograph of the post-wall CBSA made of textiles with a feed line
Fig. 1 Cavity backed slot antenna

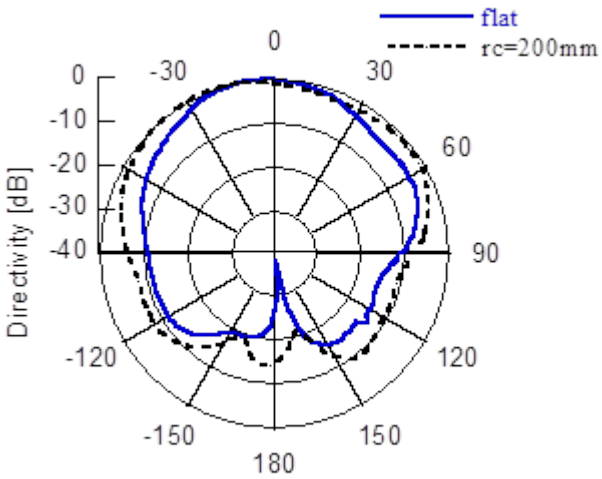
affect the resonance of the slot, so the symmetry of the radiation from the slot was considered to be broken. Comparing with the previous antenna with a fabric cavity, this antenna with a post-wall waveguide cavity showed smaller modification in the patterns by bending. This is because the deformation of the cavity was less than that of the original fabric cavity since its four side walls were just arrays of threads, not fabric walls.

The gain of a few types of textile antennas we have made were 2 to 3 dB lower than antennas made of copper plates in the same structures.

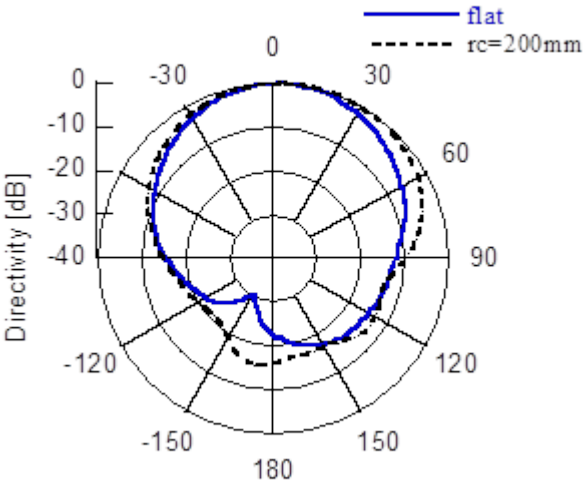
### 2.3 Summary for Textile Antennas

The conductive textile employing a traditional technology is hopeful to use in wearable electrical systems and those antenna are verified as one of the applications. The reflection and radiation characteristics of slot antennas made of textiles have been measured for the use both in a flat shape and in a spherical bend, in considering applications on a human body or on a curved item.

Miniaturizing antenna size may cause its degradation even though a transceiver can be downsized into a wearable one. So, a light and flexible antenna with keeping its size is suitable for wearable devices.




(a) E-plane pattern




(b) H-plane pattern

Fig. 2 Radiation patterns in flat and bending cases (measured)

## 3. Radio Wave Propagation in a Mulberry Field

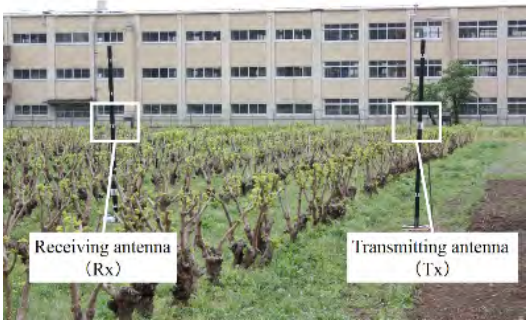
### 3.1 Wireless Sensor Network in an Agricultural Environment

Recently, studies on precision agriculture or agricultural informatics have been performed extensively. Collecting plenty of data on plant growth, crop maturity, soil and air conditions, weather, and even farmer's labors, and then analyzing their data will help farmers make smarter decisions in planting, fertilizing, harvesting crops and so forth. In such precision agriculture it is important to collect and process a huge number of data around a farm. A lot of sensors are distributed throughout a farm to measure the amount of sunlight, temperature, moisture of soil and so on. Wireless systems are employed since it is troublesome to connect such sensor nodes with cables. In that way ICT is introduced into agriculture.

It is necessary to know the path loss in wireless signal transmission. Calculating a link budget precisely will help design wireless sensor networks so that the transmission power of each wireless sensor node be minimized. Plants containing water will cause the attenuation of electromagnetic wave propagation and their growth changes the environments of propagation day by day. So, collecting the data of propagation losses in farm fields would be important. Only some specific data have been reported for wireless communication in fields.

We have measured the path loss of radio wave propagation in a farm [4,5]. A mulberry farm was chosen as an example and the characteristics on distance, polarization, frequency, and direction were investigated. The frequencies were 920 MHz and 2.4 GHz and the direction means the angle between the array of bushes and the propagation direction. In this article, the propagation attenuation characteristics in 920-MHz band and their variation with the bush growth will be partly introduced.

(a) Bushes of mulberry in mature stage




(b) Mulberry field in no-leaf stage

Fig. 3 Measured mulberry field

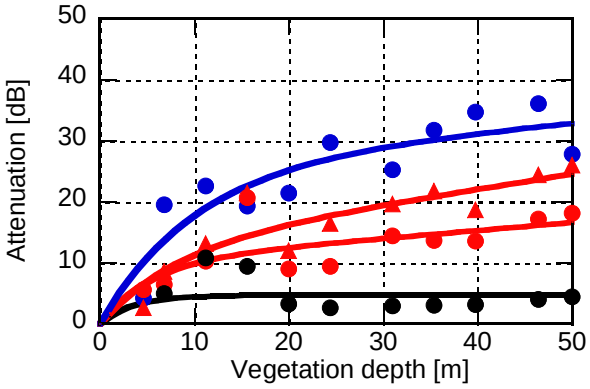
### 3.2 Wireless Module to Measure RSSI

As a wireless module to measure Received Signal Strength Indicator (RSSI), we have used MH920-Node (OKI Electric Industry); transmission output of 20 mW, 922.3 - 928.1 MHz as the frequency band, and communication speed of 100 kbps. In addition, we used sleeve antennas which have a length of 195 mm and a gain of 2.44 dBi.

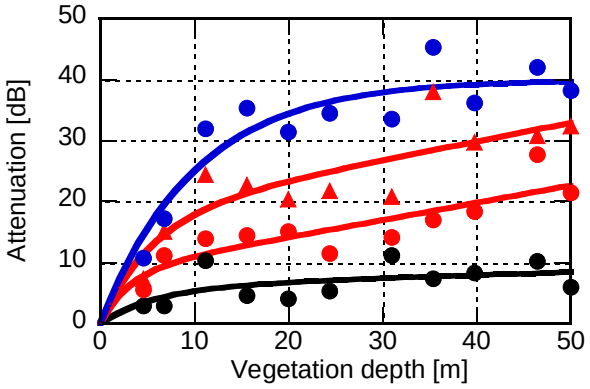
### 3.3 Mulberry Field and Measurement Setup

We measured RSSIs in a mulberry field as shown in Fig. 3. The mulberry farm was 50 x 50 m wide. The width and length of a ridge were 1.0 and 50.0 m, respectively. Each mulberry was planted at intervals of about 0.5 m on the ridge in a row. There were alleyways between the ridges and the width of the alleys was 1.2 m, so the intervals of arrays of bushes were 2.2 m. Thus, the alignments of bushes were different between the directions of north-south and east-west.

RSSIs were measured for the horizontal and vertical polarizations and converted to path losses of the propagation. The measurements were conducted in 920-MHz band from no leaf stage to mature stage. In this case, the average height of mulberry bushes changed from 1.02 to 3.27 m due to their growth. The transmitting antenna (Tx) and the receiving antenna (Rx) were placed at a height of 1.5 m.




(a) Horizontal polarization




(b) Vertical polarization

Fig. 4 Vegetation attenuations with bush growth. Four curves in each figure represent the cases of the height of 1.02, 1.56, 2.08, and 3.27 m of bushes in the order from the lower to the top.

### 3.4 Vegetation Attenuation

There are few reports on propagation loss characteristics in farms while empirical vegetation attenuation models that represent those in forests and woodlands have been presented. The vegetation attenuation expresses the path loss that exceeds the free space path loss. Three vegetation attenuation models were evaluated by fitting the measured data in the mulberry farm to their models. As a result, Non Zero Gradient (NZG) model was best fit.

The NZG model is expressed as

$$Att = R_{\infty} d + k\left\{1 - exp\left(-\frac{R_0 - R_{\infty}}{k} d\right)\right\} \quad \text{[dB]} \quad (1)$$

where $d$ is the vegetation depth in meters, $R_0$ is the initial gradient of the attenuation curve in dB/m, $R_{\infty}$ is the final gradient of the attenuation curve in dB/m, and $k$ is the offset of the final gradient in dB. Fitting parameters, $R_0$, $R_{\infty}$, and $k$, are a function of the height of bushes. The dependency of the three parameters on the growth of bushes were investigated. In addition, the difference in the polarizations was also made clear.

Figure 4 shows the vegetation attenuation with respect to the propagation distance. Four data series and fitting curves of NZG model are shown for four stages of the bush growth; the height of 1.02, 1.56, 2.08, and 3.27 m. Horizontal polarization suffers less attenuation than vertical one in general.

## 4. Concluding Remarks

The recent activities of our research group in Kyoto Institute of Technology have been introduced. The flexible antennas using conductive textiles were developed in considering applications in wearable electronic systems. And, studies on radio propagation characteristics in a farm will contribute to designing wireless sensor networks in precision agriculture.

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[5] T. Nishimura, R. Yoshimura, C. Yamada, H. Shimasaki, Y. Kado, M. Ichida, “Azimuth characteristics of radio wave propagation,” Proc. 2017 Int’l Conf. on Computational Electro-magnetics, pp.182-184, Mar. 2017.

# Report on the 9th IEICE Communications Society (CS) Welcome Party

Manabu Kai, Moriya Nakamura, Nodoka Mimura,
Koji Kamakura, Akinori Taira, and Yasunori Suzuki

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 2017 General Conference

The 9th Welcome Party was held on 22nd March 2017, the first day of IEICE General Conference at Tempaku Campus of Meijo University in Nagoya, Japan. We had 181 participants including 62 students. Many foreign students also attended the party.

The first part of the party began with a welcome message from CS president, Prof. Masayuki Murata (Fig. 1). Then it was followed by introductions of Technical Committee activities and research fields by Chair of Council of Technical Committee Representatives, Dr. Tomohiro Ishihara, (Fig. 2) and three Technical Committees of IEICE-CS: Space, Aeronautical and Navigational Electronics (SANE) (Fig. 3), Communication Systems (CS) (Fig. 4), and Communication Quality (CQ) (Fig. 5).

After all speeches, the second part of the party started with a toast from CS Vice President, Prof. Tomoaki Ohtsuki (Fig. 6), where foods and drinks were served. During the second part, all participants enjoyed food and drinks (Fig. 7) as well as free talk and discussion at the poster panels (Fig. 8). This year, the poster panels were prepared by 19 companies and national institutes that are active in IEICE-CS and also following 10 Technical Committees, 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), and Network Virtualization(NV).

Fig. 2 Introduction of IEICE-CS Technical Committees activities and research fields from Dr. Tomohiro Ishihara

Fig. 3 Presentation from Technical Committee on SANE

Fig. 1 Welcome Message from CS President, Prof. Masayuki Murata

Fig. 4 Presentation from Technical Committee on CS

Fig. 5 Presentation from Technical Committee on CQ

Fig. 6 Toast from CS Vice President Prof. Tomoaki Ohtsuki

Fig. 7 Enjoying food and drinks

Finally, CS President-Elect (current CS President), Prof. Masahiro Morikura concluded the party (Fig. 9).

Fig. 8 Talk and discussion at poster panels

Fig. 9 Concluding remarks from CS President-Elect (current CS President), Prof. Masahiro Morikura

### 3. Conclusion and Acknowledgement

The 9th Welcome Party was successfully held with 181 participants at the IEICE General Conference 2017 at Meijo University in Nagoya, Japan. Many participants both of young and experienced looked to have enjoyed this event and answered that they wanted to have more time to talk each other in the questionnaire that we collected at the end of the event. We would like to thank all participants, especially from companies, national institutes, and Technical Committee members that gave speeches and/or prepared poster panels to young researchers. We hope to have their cooperation again in the next Welcome Party which will be held in March 2017 at the IEICE General Conference at Tokyo Denki University in Tokyo, Japan. Enjoying food and drinks

# Report on NS English Session at 2017 IEICE General Conference −BS-1 Advanced Technologies in Communication, Networking, and its Innovative Application for Future Information Network Society−

Yosuke Tanigawa[*], Kazuya Tsukamoto[**], Shohei Kamamura[***], Hideki Maeda[***], Yoshikatsu Okazaki[***], and Hideki Tode[*]
[*]Osaka Pref. Univ., [**]Kyushu Inst. of Tech., [***]NTT Corp.

## 1. Introduction

The 2017 IEICE General Conference was held at Meijo University in Nagoya, Japan, on March 22-25, 2017. In the conference, the IEICE Technical Committee on Network Systems (NS) [1] provided the complete English Symposium Session entitled "Advanced Technologies in Communication, Networking, and its Innovative Application for Future Information Network Society" as one of the eight Symposium Sessions hosted by IEICE Communications Society.

## 2. Background

NS has been providing the complete English Session since 2005, in order to promote the globalization of IEICE. The Session makes a good opportunity for the attendees staying in Japan or joining from overseas to make presentations and discuss in English.

This year, 43 papers were submitted to the Session, which enabled to organize sessions during whole of four-days conference period. Table 1 and Fig. 1 show the history of the Session.

## 3. Topics and Statistics

The papers were classified into 11 sub-sessions based on the topics. The sub-sessions were held every day during the General Conference. In each sub-session, a wide range of topics including advanced technologies such as optical networking, network virtualization represented by SDN/NFV, network architecture represented by ICN, wireless networking like VANET, application technologies, network analysis, and others were actively discussed among the attendees every day.

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

## 4. Conclusion

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 effective for the globalization of IEICE.

Table 1 Past three themes of NS English Session

| Year | Theme |
|---|---|
| 2015 | Advanced Technologies in the Design, Management and Control for Future Innovative Communication Network |
| 2016 | Advanced Networking Technologies for Innovative Information Networks |
| 2017 | Advanced Technologies in Communication, Networking, and its Innovative Application for Future Information Network Society |

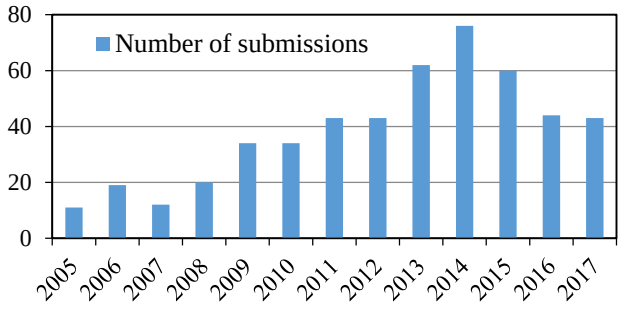



Fig. 1 Number of submissions for NS English Session

In addition, NS awards a prize to the selected papers in each year to encourage their continuous activities [2].

However, the number of submissions is decreasing in recent years, as shown in Fig. 1. It is one of our hopes to provide the English Session during whole of the conference period, but this becomes impossible if the number keeps decreasing. We encourage Japanese students as well as students from overseas to have presentations in the English Session as a first step to submitting their research results to 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 authority and human relations.

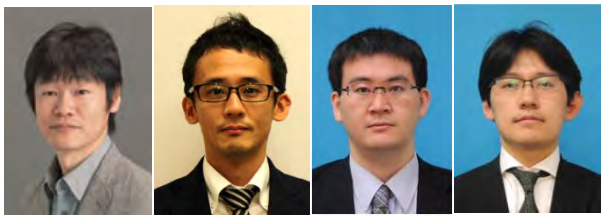
## 5. Reference

[1] IEICE Technical Committee on Network Systems web site, http://www.ieice.org/~ns/eng/.
[2] H. Tode, et al.: "Report on the 2016 NS English Session Awards and Award Ceremony," *IEICE Global NewsLetter*, vol. 41, no. 1, pp. 24-25, March 2017.

# Annual Report of Technical Committee on Information Networks (IN)

Kunitake Kaneko[†], Takeshi Kitahara[††], Takashi Natsume[†††], Tatsuro Kimura[†††],

[†]Keio University, [††]KDDI Research Inc., [†††]NTT Corporation



## 1. Introduction

The technical committee on Information Networks (IN) is one of technical committees of the Communications Society of the IEICE [1]. The IN addresses a broad spectrum of issues associated with information networks and provides a forum for researchers and engineers to discuss various research and development topics. The chairman is Assoc. Prof. Katsunori Yamaoka of Tokyo Institute of Technology. The vice chairman is Mr. Takuji Kishida of NTT Corporation. The secretaries are Mr. Takeshi Kitahara of KDDI Research Inc. and Mr. Tatsuro Kimura of NTT Corporation. The assistant secretaries are Assist. Prof. Kunitake Kaneko of Keio University and Mr. Takashi Natsume of NTT Corporation. This document presents the IN's annual report for activities from April 2016 to March 2017.

## 2. IN Activities

The IN is one of the most active technical committees of the IEICE Communications Society. The IN held nine two-day technical meetings from April 2016 to March 2017, some of which are co-organized with another institute (IEE) or other technical committees in IEICE (RCS, ICT-SG, NV, CS, NS, NWS, ICTSSL, MoNA, CNR, IA, and ICN). Many researchers participated in the meetings and reported their latest technical research and development results. The venues and the main topics of each meeting are shown in Table 1.

Each submitted paper is published as a Technical Report of the IEICE. Authors of selected papers have received the 23rd Information Networks Research Awards, and the young first authors (32 years old or less) of selected papers have received the 2nd Young Researcher Awards of Information Networks in March 2017 (Figs. 1 and 2).

In this year, the following two excellent papers were selected from 237 papers for the 23rd Information Networks Research Awards.

- H. Hayashi, Y. Utsunomiya, T. Xuejun, and T. Okuda, "Performance evaluation of delay tolerant network with mobile phones and drones".
- S. Kashima, M. Ueno, T. Aso, and T. Miyazawa, "Consideration about deriving the security requisites for secure IoT services".

Fig. 1 Winners of IN Research Award in 2016 (From left to right) H. Hayashi, S. Kashima, and K. Yamaoka (Chairman)

Fig. 2 Winners of Young Researcher Award of IN in 2016 (From left to right) T. Sunaga, Y. Nishiyama, R. Ohmiya, Sakamoto, and K. Yamaoka (Chairman)

In addition, four young authors won the 2nd Young Researcher Awards of Information Networks. The selected papers are as follows.

- R. Ohmiya, H. Obata, and T. Murase, "Fairness Control of Contention Window for Parallel Transfer Ad-Hoc Network with Legacy Network".

- Y. Nishiyama, M. Ishino, Y. Koizumi, and T. Hasegawa, T. Sugiyama and A. Tagami, "A Proposal on Routing-Based Distributed Mobility Management for 5G".
- T. Sunaga and T. Asami, "ICN Link-state Routing for Disrupted Networks in a Disaster Area - Enhanced NLSR using Linc-cost of Transmission Latency-".
- H. Sakamoto and Y. Kawahashi, "Construction of Evaluation System in Crisis Management Contest".

**Reference**

[1] Technical Committee on Information Networks http://www.ieice.org/cs/in/eng/

Table 1 Technical meeting schedule

| Date | Venue | Main topics | Num. of reports | Num. of participants each day |
|---|---|---|---|---|
| May 19-20 2016 | Kikai-Shinko-Kaikan Bldg. (Tokyo) | Adhoc network, Sensor network, MANET, Mobile network, M2M Communication management, Wireless LAN (Wi-Fi), IEEE 802.15 (ZigBee), etc. | 17 | 87, 71 |
| Jun. 16-17 | Shizuoka Univ. (Hamamatsu) | Home Area Network (HAN), Green/Energy Saving ICT, Smart Grid, Contingency Plan/BCP, Data Analysis/Processing Platform, Big Data, etc. | 5 | 60, 55 |
| Jul. 15-16 | Matsumae town center (Matsumae) | Next Generation/New Generation/Future Network, Cloud/Data Center Network, SDN (Open Flow etc.), NFV, IPv6, Overlay Network, P2P, Content Distribution, Content Exchange, TCP/IP, BGP, DNS, HTTP/2, Routing, Switching, Traffic Engineering, etc. | 14 | 34, 25 |
| Sep. 29-30 | Tohoku Univ. (Sendai) | Post IP networking, Next Generation Network (NGN)/New Generation Network (NWGN), Contingency Plan/BCP, Network Coding/Network Algorithms, Session Management (SIP/IMS), Internetworking/Standardization, Network configuration, etc. | 12 | 52, 35 |
| Oct. 20-21 | Osaka Univ. (Osaka) | Network Reliability, Security, Privacy Protection, AAA, ID management, Web Services/SOA/ROA, Cyber Attack Resolution, Resilience, Disaster Recovery, Fault Tolerance, etc. | 12 | 40, 39 |
| Nov. 17-18 | Kirishima Kanko Hotel (Kirishima) | M2M, IoT, Self Organization, Autonomous Distributed Control, Car Area Network, Car-Car network, Car-Road Network, ITS, Big Data Analysis, Cyber Physical System (CPS), Security Privacy Protection, Social Network (SNS), Cyber Attack resolution, Mobile Virtualization, Mobile Application, Cloud Robotics Service, etc. | 6 | 43, 40 |
| Dec. 15-16 | Hiroshima City Univ. (Hiroshima) | Performance Analysis and Simulation, Robustness, Traffic and Throughput Measurement, Quality of Service (QoS) Control, Congestion Control, Overlay Network/P2P, IPv6, Multicast, Routing, DDoS, etc. | 22 | 43, 24 |
| Jan. 19-20 2017 | Satellite campus of Aichi Pref. Univ. (Nagoya) | Contents Delivery/Contents Exchange, Social Networking Service (SNS), Data Analysis/Processing Platform, Big Data, etc. | 12 | 27, 23 |
| Mar. 2-3 | Okinawa Zampamisaki Royal Hotel (Yomitan) | General topics and workshop | 76 | 194, 165 |

# Report on 33rd NS/IN Research Workshop

Kunitake Kaneko†, Takashi Natsume††, Takeshi Kitahara†††, Tatsuro Kimura††, Takuji Kishida††, Katsunori Yamaoka††††, Shohei Kamamura††, Hideki Maeda††, Kazuya Tsukamoto†††††, Yoshikatsu Okazaki††, and Hideki Tode††††††

†Keio Univ., ††NTT Corp., †††KDDI Research Inc., ††††Tokyo Inst. of Tech., †††††Kyushu Inst. of Tech., ††††††Osaka Pref. Univ.

## 1. Introduction

The 33rd NS/IN Research Workshop took place in Okinawa, Japan, on March 2, 2017. The workshop was sponsored by the technical committee on Network Systems (NS) and Information Networks (IN) of the IEICE Communications Society. The workshop's aim was to discuss the technical direction and research topics for future networks. A record showing of 175 participants testified to the success of the workshop (Fig. 1). The overall theme was "Future realized by Network and AI". The workshop featured one invited talk session and one panel session.

Fig. 1 Audience-filled hall

Fig. 2 Opening speech of the workshop Prof. Tode

## 2. Invited Speakers

The general chair of the workshop, Prof. Hideki Tode (Osaka Pref. Univ.), invited 5 distinguished experts in AI and Network (Fig. 2). These speakers addressed the latest AI technologies and possibilities of combination of AI and network technologies. Figs 3 to 7 show photographs of the speakers.

- Prof. Koutaro Nakayama (the University of Tokyo) presented the foundation and application of deep learning.

Fig. 3 Invited speaker: Prof. Nakayama

- Dr. Norihiko Moriwaki (Hitachi) presented artificial intelligence technologies for converting big data into economic values.

Fig. 4 Invited speaker: Dr. Moriwaki

• Dr. Satoshi Morinaga (NEC) presented about decision support using AI technologies.

Fig. 5 Invited speaker: Dr. Morinaga

• Prof. Akihiro Nakao (The Univ. of Tokyo) presented the possibilities of network capable of “thinking”.

Fig. 6 Invited speaker: Prof. Nakao

• Dr. Ryoichi Kawahara (NTT) presented the advanced network operation using AI and machine learning.

Fig. 7 Invited speaker: Dr. Kawahara

### 3. Panel Session

After the invited talks, the panel session was held. The session was moderated by the general chair, Prof. Tode. All of the above invited speakers were invited as panelists. In this session, the challenges of research about AI and network technologies were discussed.

### 4. Conclusion

This year’s workshop invited key persons to speak on the combination of AI and network. The audience filled the hall as shown in Fig. 1. We believe that the presentations given by the invited speakers and the discussion provided fruitful insight into research and development.

The technical committee on IN and NS plans to hold next year’s workshop in March 2018. Finally, we would like to express our gratitude to the workshop committee members, particularly to Tadashi Komatsu (NEC Corp.), Kouji Tsubouchi (FUJITSU LABORATORIES LTD.), Takeshi Suehiro (Mitsubishi Electric Corp.), Yuta Kobayashi (TOSHIBA Corp.), and Yuji Ohishi (Hitachi, Ltd.) who made a great effort to realize this workshop.

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

Masao Murata (Fujitsu), ICM Secretary
Eiji Takahashi (NEC), ICM Secretary
Masaharu Hattori (KDDI Research), 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 2016 to March 2017. The venues and the main topics of each meeting are shown in Table 1. In addition, 3 special sessions were sponsored by ICM as shown in Table 2.

Of particular note, in the English session in 2016 IEICE Society Conference at Hokkaido University, the number of papers reached 35 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.

Table 1 ICM Technical Meetings in 2016

| No | Date | Venue | Main Topics | Joint |
|---|---|---|---|---|
| 1 | May 26-27 | Tottori Prefecture Citizens' Culture Hall (Tottori) | Service Management, Operation/Administration, Security Management, etc. | IPSJ-IOT IPSJ-CSEC |
| 2 | July 7-8 | Canal Plaza (Otaru) | Management Function, Management Theory, etc. | - |
| 3 | Nov. 24-25 | Shimonoseki Chamber of Commerce and Industry (Shimonoseki) | Network Quality, Network Management and Measurement, Network Virtualization | CQ NS NV |
| 4 | Jan. 19-20 | Nagasaki Chamber of Commerce and Industry (Nagasaki) | Applications and Research Opportunities of Life Log, Office Information System and Business Management | LOIS |
| 5 | Mar. 9-10 | Hirara Port Terminal Building (Miyakojima) | Element Management, Management Functionalities, Operations and Management Technologies, etc. | - |

Table 2 Special Sessions by ICM in 2016

| Title | Date | Remarks | Theme |
|---|---|---|---|
| English session | Sept. 20-22 | as one of the symposium sessions in IEICE Society Conference | Network and Service Design, Control and Management |
| APNOMS | Oct. 5-7 | the premier conference in the Asia Pacific region sponsored by ICM | - |
| ICM Workshop | Mar. 9 | held in conjunction with ICM Technical Committee Meeting | Disaster Prevention Technologies and Operations for the IoT |

Fig.1 The panel session at Miyakojima

Furthermore, ICM Workshop 2017 was held in Miyakojima (Okinawa pref.). In the panel session, six invited speakers presented and discussed the theme, to the obvious interest of the more than 40 attendees. A banquet was held to promote social intercourse, and at the same time, to celebrate the ICM annual award winners in 2016.

## 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 3 Winners of ICM Awards in 2016

| Award | Winners | Title |
|---|---|---|
| Research Award | Sakiko Takenaka, et al. | Playout Buffer Control Based on Throughput History Data for Robust and Energy-Friendly Mobile Video Delivery |
| | Eiji Takahashi, et al. | Available Bandwidth Estimation Based on Received Power of LTE User Equipment |
| | Akio Watanabe, et al. | Multiple Isolating Actions Extraction from Action Logs for Clarifying Trouble-shooting Process |
| English Session Encouragement Award | Bo Wei | Performance evaluations of history-based throughput prediction with trend analysis for mobile network |
| | Victor Torres da Costa | Resilient Controller Placement Mechanism in Split-Domain SDN |

# IEICE Fellow Conferred on 7 IEICE-CS Members

Manabu Kai
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 2016, IEICE Fellow is conferred on 25 IEICE members including 7 from Communications Society (CS) who are listed in Table 1.

## 2. The Conferment Ceremony

On 24th March during IEICE General Conference 2017 in Nagoya, Aichi, the 17th Fellow Conferment Ceremony was held (Fig.1). In the Ceremony, Prof. Ken-ichi Sato, 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, 2018.

Table 1 New IEICE Fellows from Communications Society

| Name | Contribution contents |
|---|---|
| Tetsushi IKEGAMI | For contributions to research promotion of spread spectrum technique and medical ICT |
| Yukitoshi SANADA | For contributions to research on signal processing for cognitive radio receivers |
| Takahiko SABA | For contributions to editing activities for development of researchers of communications technology |
| Akira TAKAHASHI | For contributions to research, development, and international standardization of QoE assessment for audiovisual communication services |
| Shigeru TOMITA | For contributions to development and international standardization of optical fiber line technologies for access networks |
| Takashi HARADA | For contributions to research and development of EMC design technologies for printed circuit boards |
| Kiyoshi FUKUCHI | For contributions to research and development of 10-Tbps optical WDM transmission system technologies |


Fig. 1 Photo in the Fellow Conferment Ceremony with Prof. K. Sato, President of IEICE and Prof. M. Murata, President of IEICE Communications Society

# Report on the 11th International Symposium on Medical Information and Communication Technology (ISMICT 2017)

Daisuke Anzai
Nagoya Institute of Technology

## 1. Introduction

The 11th International Symposium on Medical Information and Communication Technology (ISMICT 2017) was held at Institute Superior Técnico (IST), Lisbon, Portugal, from Mach 6th to 8th, 2017. This symposium was technically co-sponsored by the IEEE Communication Society Portugal Chapter, IEEE Portugal Joint Chapter on Antennas & Propagation (AP), Electron Devices (ED) and Microwave Theory & Techniques (MTT), IEICE Technical Committee on Healthcare and Medical Information Communication Technology (IEICE TC-MICT), and Centre of Wireless Communications (CWC) Nippon.

## 2. Organization

The organizing committee of ISMICT 2017 was formed with the General Chair Prof. Luís M. Correia (University of Lisbon, Portugal) and the General Vice Chair Prof. Custódio Peixeiro (University of Lisbon, Portugal). In addition, the technical program committee was organized with the TPC Co-Chairts; Prof. Jorge Costa (University Institute of Lisbon, Portugal), Dr. Raquel Conceição (University of Lisbon, Portugal), and Dr. Matti Hamalainen (University of Oulu, Finland).

## 3. Conference Program

The symposium presentations started with two keynote addresses by Prof. Ryuji Kohno (Yokohama National University, Japan) and Prof. Ana Teresa (University of Lisbon, Portugal). During ISMICT 2017, we had 21 technical presentations with 4 regular sessions as follows:

- BAN Technology (PHY, MAC, Protocols)
- Antennas and Radio Propagation for Wireless BAN
- Human Body Communications, Energy Efficiency and Reliability
- Signal Processing Algorithms for Medical Appliations

## 4. International Workshop on Medical Device Regulatory Science (MDRS)

On the second day of the symposium, an international workshop on Medical Device Regulatory Science (MDRS) took place with the chair Prof. Masayuki Fujise (Yokohama National University, Japan). This workshop had two keynote addresses given by Dr. Sinikka Salo (MD, PhD. Leader of change in reforming social welfare and healthcare, Ministry of Social Affairs and Health, Finland) and Prof. Lucila Ohno-Machado (MD, PhD, Division of Biomedical Informatics, University of California, San Diego, USA). After the keynote addresses, a panel presentation was organized by the moderator Prof. Ryuji Kohno together with the following panelists (Fig. 1):

Fig. 1 International workshop on MDRS

- Prof. Ms. Chika Sugimoto (Yokohama National University, Japan)
- Dr. Ms. Sinikka Salo (Ministry of Social Affairs and Health, Finland)
- Prof. Lorenzo Mucchi (Univ. Florence, Italy)
- Prof. Eryk Dutkiewicz, (Technology University of Technology Sydney, Australia)

## 5. Awards

The organizing committee selected the following two papers as “Best Paper Award” and “Best Student Paper Award,” respectively:

- Best Paper Award: “Determining the Transmission Efficiency for Human Body Communication Using a Multilayered Phantom,” presented by Dr. Dairoku Muramatsu (Tokyo University of Science, Japan)
- Best Student Paper Award: “Received Signal in Harmonic Motion Microwave Doppler Imaging as a Function of Tumor Position in a 3D Scheme,” presented by Mr. Ümit İrgin (Middle East Technical University, Turkey)

## 6. Conclusion

I believe that ISMICT 2017 was a really successful symposium for all participants. Finally, I would like to announce with great pleasure that the next symposium ISMICT 2018 will be held on March 26th to 28th, 2018, in Sydney, Australia (for more details, please visit http://ismict2018.org).

# Report on IEEE WCNC 2017
# 3rd International Workshop on Smart Spectrum (IWSS 2017)

Mai Ohta
Fukuoka University

Fig. 1 International Workshop on Smart Spectrum (IWSS) in conjunction with IEEE WCNC 2017 [1]

## 1. Introduction

The International Workshop on Smart Spectrum (IWSS) was organized in conjunction with IEEE Wireless Communications and Networking Conference (WCNC), which was held at San Francisco, CA, The United States of America on 19-22 March 2017. IWSS was held on 19 March 2017.

IWSS is cooperated with IEICE Communications Society.

## 2. History of IWSS in conjunction with IEEE WCNC

The first IWSS was held at New Orleans, The United States of America on March 9, 2015 in conjunction with IEEE WCNC 2015. The workshop consists of keynote sessions (2 speeches), oral sessions (11 papers), and poster session (6 posters). The acceptance ratio was 17/27=63.0%.

The second IWSS was held at Doha, Qatar on April 3, 2016. The workshop consists of keynote sessions (2 speeches), oral sessions (6 papers), and poster session (5 posters). The acceptance ratio was 11/27=40.7%.

## 3. Interesting Topics of IWSS

IWSS focuses on wireless network technology based on spectrum measurement, spectrum utilization modeling, and their applications for dynamic spectrum access. One part of topics is the follows, but are not limited to:

- Spectrum measurement techniques (wideband, long-term, and wide area measurements)
- Spectrum measurement campaigns and system prototyping
- Sensor networks for spectrum measurement

Fig. 2 Prof. K. Umebayashi (Tokyo University of Agriculture and Technology, Japan), general chair of IWSS [Introduction]

- Spectrum utilization database techniques
- Multidimensional spectrum utilization models
- Statistical modeling of radio environment
- Radio propagation modeling for spectrum sharing
- Cognitive radio networks and dynamic spectrum access
- Advanced spectrum sensing techniques
- Advanced MAC layer protocol design

The purpose of IWSS is to find new spectrum world for future mobile communications!

## 4. Summary of IWSS 2017

In IWSS, 9 papers for oral sessions were accepted from submitted 27 papers. IWSS consists of one keynote speech and two oral sessions. The acceptance ratio is 9/27=33.3%.

Keynote session and oral sessions had around 20 to 25 attendees. This year did not have poster session.


Fig. 3 Dr. Jim Lansford (Qualcomm Technologies, Inc.) [Keynote Speech]

## 5. Keynote Speech

Keynote speaker presented as follows:

- "Standards Bodies and Smart Spectrum Utilization," Keynote speech by Dr. Jim Lansford (Director, Technical Standards, Qualcomm Technologies, Inc., America)

## 6. Best Paper Awards

IWSS awarded two papers with the best paper award as follows:

- "**An implementable channel and CFO estimation scheme for IEEE 802.22-based radio equipment**," *Hiroki Ueno, Keiichi Mizutani, Takeshi Matsumura, Hiroshi Harada.*
- "**Data tracking using frequency offset and SIC for physical wireless conversion sensor networks**", *Takehiro Sakai, Osamu Takyu, Keiichiro Shirai, Mai Ohta, Takeo Fujii, Fumihito Sasamori, Shiro Handa.*

*Underline: Presenter in IWSS 2017

## 7. Aspect of San Francisco

San Francisco is big city, which has many shops, big famous department store, and grocery supermarkets. Moreover, there are many sightseeing spots, e.g., Golden Gate Bridge, cable car, Fisherman's Wharf, and so on. It will be good idea to travel on a sightseeing trip.

However, because there is potential that a rough area neighbors, it needs to be careful in selecting a cheaper hotel in San Francisco.

In the season that IWSS 2017 was held, cherry blossoms bloom and it is the best time to view cherry blossoms. The time of bloom in San Francisco is earlier than that in Japan.

## 8. Acknowledgements

The IWSS committee members would like to give thanks to authors, speakers, participants, and staff.

## 9. References

[1] https://smartspectrum.wordpress.com/


Fig. 4 Best Paper Award: Mr. T. Sakai (Shinshu University, Japan)


Fig. 5 Best Paper Award: Mr. H. Ueno (Kyoto University, Japan)

Fig. 6 Golden Gate Bridge

Fig. 7 Cherry blossom and San Francisco

# Report on 2017 International Conference on Computational Electromagnetics (ICCEM2017)

Takeshi Fukusako
Kumamoto University

## 1. Introduction

The 2017 IEEE International Conference on Computational Electromagnetics (ICCEM2017) was held at Kumamoto Prefectural Community Center Parea on March 8th – 10th, 2017. This conference was fully sponsored by IEEE Antennas and Propagation Society (APS), and technically sponsored by IEEE APS Fukuoka Chapter, IEICE Communication Society and IEICE Electronics Society. This conference brought researchers and practitioners the latest advances focusing on numerical algorithms, modeling methods, optimization, and computing platforms for applications across the whole electromagnetic spectrum. In this article, the author reports this conference.

## 2. Conference Program


Fig. 1 Opening Ceremony chaired by Prof. Christian Pichot (Université de Nice-Sophia Antipolis, France), General Co-chair of ICCEM2017

The ICCEM2017 was opened on 8th morning like Fig. 1. This conference is the 3rd IEEE APS-sponsored conference following Hong Kong (2015) and Guangzhou (2016). The conference venue was the central downtown of Kumamoto City where many hotels restaurants and sightseeing spots are located. The number of registered participants was 185 people. The majority of participants is from Japan and some Asian countries such P. R. China, Taiwan and South Korea. In addition, some participants are from outside of Asia-Pacific such as the US, Canada and European countries. Such number of participants was very good though two big earthquakes with M. 6.9 and 7.3 had taken place around Kumamoto City area one-year prior to the conference. It's true that the venue area lost some charm of sightseeing by the earthquake, in fact, the Kumamoto Castle has been closed. However, there seemed fortunately to be no effect on the number of participants.

The technical program consists of 8 keynote speeches, 25 oral sessions (including 12 special sessions) and 1 poster session. As the keynote speeches, 8 experienced professors in the field of computational electromagnetics gave excellent talks in plenary sessions (Typical scene is Fig. 2). Followings are the keynote speakers (in presentation order);

Prof. Dan Jiao (Purdue Univ., USA)

- Prof. Tapan K. Sarkar (Syracuse Univ., USA)
- Prof. Michel M. Ney (Telecom Bretagne Inst., France)
- Prof. Mahta Moghaddam (Univ. of Southern California, USA)
- Prof. Makoto Ando (Tokyo Inst. of Tech., Japan)
- Prof. Qing Huo Liu (Duke Univ., USA)
- Prof. Magdalena Salazar Palma (Carlos III Univ. of Madrid, Spain)
- Prof. Roberto Graglia (Polytechnic of Turin, Italy)

Fig. 2 A keynote speech (by Prof. Dan Jiao)

In addition, there were 12 special sessions. Followings are the special sessions and organizers;

- Advanced Computational Methods for Electro-magnetic Problems
  Prof. Jun Shibayama (Hosei University)
  Prof. Shinichiro Ohnuki (Nihon University))

- High-Frequency Methods
  Prof. Ryoichi Sato (Niigata University, Japan)
  Prof. Keiji Goto (National Defense Academy, Japan)

•Metamaterials and Their Applications
Prof. Tetsuya Ueda (Kyoto Inst. of Tech., Japan)
Prof. Takuji Arima (Tokyo Univ. of Agri. and Tech., Japan)

•Recent Approaches to Periodic Structures
Prof. Koki Watanabe (Fukuoka Inst. of Tech., Japan) Prof. Gerard Granet (Blaise Pascal Univ., France)

•Linear, Nonlinear, and Quantum Electromagnetic Modeling for Metamaterials and Metasurfaces
Prof. Wei E.I. Sha (The Univ. of Hong Kong) and Prof. Zhixiang Huang (Anhui Univ., China)

•Novel Wireless Power Transfer Theory and Technologies
Prof. Naoki Shinohara (Kyoto Univ., Japan)

•Education in Electromagnetics
Prof. Mitsuo Taguchi (Nagasaki Univ., Japan)

•5G Mobile Radio Propagation
Dr. Tetsuro Imai (NTT DOCOMO, INC., Japan)

•Advanced Antenna Technologies and Related Applications in Modern Logistic, Communication and Sensing Networks
Prof. Hang Wong (City Univ. of Hong Kong, China) Prof. Xiuyin Zhang (South China Univ. of Tech., China)

•Novel Antenna Designs and Applications
Organizers :
Prof. Chow-Yen-Desmond Sim (Feng Chia Univ., Taiwan)
Prof. Wen-Shan Chen (Southern Taiwan Univ. of Sci. and Tech., Taiwan)

•New Technology and Knowledge in Electromagnetic Scattering
Prof. Young Ki Cho (Kyungpook National Univ., Korea)

•IEEE APS Invited Lecture Session
IEEE APS Administrative Committee

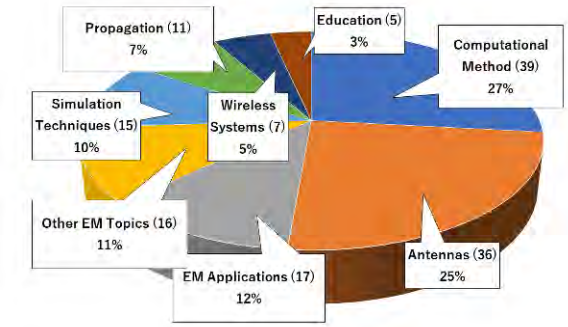
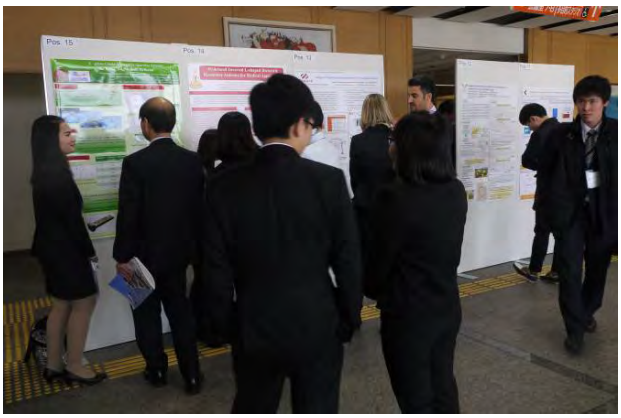



Fig. 3 Breakdown per topic

(a) Oral Session



(b) Poster Session

Fig. 4 Sessions in the conference

Finally, 155 papers were published in the program including 8 keynote speeches and 22 invited papers. The breakdown per topic is shown in Fig. 3. The technical program was very rich especially for the researchers of computational electromagnetics.

During the 3 days from 8th to 10th March, there are 4 sessions parallelly. All of the rooms are always occupied by many audiences as shown in Fig. 4(a), and they had active discussions on many presentations.

In addition to the oral sessions, there were a poster session, where many people were surrounding the posters and speakers. Fig. 4(b) is a scene of the poster session.

### 3. Banquet

On the second day, the participants enjoyed Banquet at Hotel Nikko Kumamoto. Approximately 110 people joined there. At the banquet, the IEEE Ulrich L. Rohde Innovative Conference Paper Award was presented to two authors of most innovative papers as seen in Fig. 5. After the award presentation, Yamaga-Tourou Dance, a local traditional performance by female dancers wearing a lantern (Kana-Tourou) on their head, was performed. A part of the scene is shown in Fig. 6. The elegant dance with a traditional music Yoheho-Bushi attracted participants.


Fig. 5 Award winners: Prof. Jun Shibayama (Hosei Univ., Japan) and Prof. Mao-Kun Li (Tsinghua Univ., China) (From Left to Right). The award presenter is Prof. Ahmed Kishk (Concordia Univ. , Canada), the 2017 APS President.

Fig. 6 Yamaga-Tourou Dance in the banquet. The dancers are wearing a Kana-Tourou (lantern) made of paper and glue.

## 4. Summary

The ICCEM2017 was successfully held in Kumamoto Japan. We hope that all of participants in this conference enjoyed the program and the latest advances of research and development on Computational Electromagnetics and its applications. It was impressive that there were always many participants in the conference floor until the afternoon of the final day. The next ICCEM2018 has been appointed to be held in Chengdu, China. The author hopes that the next edition would be a successful conference.

We will be happy if participants enjoyed staying around Kumamoto city area with local culture and sightseeing spots such as Kumamoto Castle nearby the venue (Fig. 7). Finally, the steering committee would like to thank all of the speakers, participants and steering members.

Fig. 7 Kumamoto Castle from the conference venue

## 5. Reference

Conference Web Site:
http://ewh.ieee.org/r10/fukuoka/aps/ICCEM2017/

# Report on ICOIN 2017

Hajime Shimada
Nagoya University

## 1. Introduction

The International Conference on Information Networking (ICOIN) [1] is an international conference which is organized by Korea Institute of Information Scientists and Engineers (KIISE) with technically co-sponsored by IEEE Computer Society and IEICE Communications Society Internet Architecture Technical Committee. ICOIN 2017 was held in Da Nang, Vietnam, from January 11 through January 13, 2017, as the 31st conference of ICOIN.

## 2. Statistics

Many papers were submitted to the conference from all over the world, and each paper was reviewed by at least three independent reviewers. The review process was carefully managed by EDAS [2]. 301 papers were submitted to the conference from 29 countries. After the review process, 82 papers were accepted as oral presentations and 64 papers were accepted as poster presentations. The 82 oral papers were categorized into 12 technical sessions which was held under 2 parallel tracks. The 64 poster papers are categorized into 6 poster sessions. The sessions covered a wide variety of information networking related latest topics including Wireless, Mobile, IoT, Routing, SDN/NFV, Could, PHY, Security, Sensor, Cognitive Radio, Applications, VANET/MAC, and Services. From Japanese organizations, 21 people gave oral presentations and 4 people gave poster presentations.

## 3. Technical Session

The various oral and poster presentations were performed for three days. Here's some papers which I got some impression.

Pai et al. proposed SLA-driven ordered variable width windowing for service chain deployment. The proposal focuses attention on the service that consist of several sub applications. In deployment of these service, prior algorithm sometimes violates especially in network latency area because it sometimes allocates each application into latency susceptible host machines. The proposal includes service level agreements in resource allocation and formulate it in allocation algorithm. The proposal achieved better user acceptance rate and latency violations than that of traditional first-fit and best-fit algorithm. This paper got best paper award in ICOIN 2017.

Yang et al. proposed new Visual Cryptography based password authentication that can create different shared images from same ID and password. In practical world, many user share ID and password among services even if those habit creates additional security incident if one services flows authentication information with security incident. The proposal can create different shared images from same ID and password pair by decomposing one pixel pattern to several pixel pattern by supposing OCR in post-processing. Thus the proposal can register different shared image to different servers even is the user uses same ID and password so that one shared image flow from one server does not affect the other authentication.

Fig. 1 Opening remark with a lot of participator

There were also many other interesting papers, and participators and presenter had active discussions especially in Wireless, Mobile, and IoT area.

## 4. Conclusion

The next ICOIN 2018 is announced to be held in Chiang Mai, Thailand from January 10 through January 12, 2018. The Technical Committee on IEICE-CS Internet Architecture will continue to support the conference and hope plenty of submissions from Japan, particularly from the member of IEICE-CS.

## 5. References

[1] http://www.icoin.org/
[2] https://edas.info/
[3] Y.-M. Pai, et al., "SLA-driven Ordered Variable-width Windowing for Service-chain Deployment in SDN Datacenters," In Proc. of ICOIN 2017, pp. 167-172, Jan. 2017.
[4] D. Yang, et al., "Enhanced Password Processing Scheme Based on Visual Cryptography and OCR," In Proc of ICOIN 2017, pp. 254-258, Jan. 2017.

# IEICE-CS Related Conferences Calendar

| Date | Conference Name | Location | Note |
|---|---|---|---|
| 11 Dec. – 13 Dec. 2017 | The 23rd Asia-Pacific Conference on Communications (**APCC2017**) | Perth, Australia | Submission deadline: 1 Jun. 2017 |
| 4 Dec. – 6 Dec. 2017 | 2017 IEEE International Conference on Antenna Measurements & Applications (**2017 IEEE CAMA**) | Tsukuba, Japan | Submission deadline: 1 Aug. 2017 |
| 26 Nov. – 30 Nov. 2017 | 13th Int. Conference on Network and Service Management (**CNSM2017**) | Tokyo, Japan | Submission deadline: 12 Jun. 2017 |
| 5 Nov. – 8 Nov. 2017 | International Conference on Renewable Energy Research and Applications (**ICRERA2017**) | San Diego, USA | Submission deadline: 15 Jun. 2017 |
| 30 Oct. – 2 Nov. 2017 | 2017 International Symposium on Antennas and Propagation (**ISAP2017**) | Phuket, Thailand | Submission deadline: Closed |
| 18 Oct. – 20 Oct. 2017 | International Conference on Information and Communication Technology Convergence 2017 (**ICTC2017**) | Jeju Island, Korea | Submission deadline: 30 Jun. 2017 |
| 27 Sep. – 29 Sep. 2017 | Asia-Pacific Network Operations and Management Symposium (**APNOMS2017**) | Seoul, Korea | Submission deadline: Closed |
| 14 Sep. – 15 Sep. 2017 | Special European Conference on Optical Communications 2017 Symposium (**Special ECOC 2017 Symposium**) | Copenhagen, Denmark | Invited Only |
| 21 Aug. – 25 Aug. 2017 | The 24th Congress of the International Commission for Optics (**ICO-24**) | Tokyo, Japan | To be held **soon** |
| 24 Jul. – 28 Jul. 2017 | Photonic Networks and Devices /APC 2017 | New Orleans, USA | To be held **soon** |
| 4 Jul. – 7 Jul. 2017 | International Conference on Ubiquitous and Future Networks 2017 (**ICUFN2017**) | Milan, Italy | To be held **soon** |
| 12 Jun. – 14 Jun. 2017 | The 23rd IEEE International Symposium on Local and Metropolitan Area Networks (**LANMAN2017**) | Osaka, Japan | To be held **soon** |
| 7 Jun. – 9 Jun. 2017 | International Symposium on Extremely Advanced Transmission Technology (**EXAT2017**) | Nara, Japan | To be held **soon** |
| 4 Jun. 2017 | Technology Trials and Proof-of-Concept Activities for 5G and Beyond (**TPoC5G**) | Sydney, Australia | To be held **soon** |
| 21 May 2017 | The 10th International Workshop on Evolutional Technologies & Ecosystems for 5G and Beyond (**WDN-5G ICC2017**) | Paris, France | Done |
| 22 Mar. – 24 Mar. 2017 | The 13th International Symposium on Autonomous Decentralized Systems (**ISADS2017**) | Bangkok, Thailand | Done |
| 19 Mar. – 22 Mar. 2017 | The third International Workshop on Smart Spectrum (**IWSS2017**) | San Francisco, USA | **Reported** on this issue |
| 8 Mar. – 10 Mar. 2017 | 2017 IEEE International Conference on Computational Electromagnetics (**ICCEM2017**) | Kumamoto, Japan | **Reported** on this issue |
| 6 Feb. – 8 Feb. 2017 | The 11th International Symposium on Medical Information and Communication Technology 2017 (**ISMICT2017**) | Lisbon, Portugal | **Reported** on this issue |
| 1 Jan. – 13 Jan. 2017 | The 31st International Conference on Information Networking (**ICOIN2017**) | Da Nang, Vietnam | **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 |
|---|---|---|
| Feb. 2019 | Recent Progress in Antennas and Propagation in Conjunction with Main Topics of ISAP2017 | Submission due**:** 15 February 2018 **See page 33** |
| Oct. 2018 | Wireless Distributed Networks for IoT Era | Submission due**:** 2 November 2017 **See page 32** |
| Aug. 2018 | Autonomous Decentralized Systems Technologies and Approaches Innovation through Structure Change of Society and Life | Submission due**:** 1 September 2017 **See page 31** |
| Jul. 2018 | Communication Quality in Wireless Networks | Submission due**:** 17 August 2017 **See page 30** |
| Apr. 2018 | Optical Access System for Social Life | To be issued |
| Mar. 2018 | Network Resource Control and Management for IoT Services and Applications | To be issued |
| Feb. 2018 | Recent Progress in Antennas and Propagation in Conjunction with Main Topics of ISAP2016 | To be issued |
| Jan. 2018 | Internet Technologies to Accelerate Smart Society | To be issued |
| Dec. 2017 | No special section this issue | |
| Nov. 2017 | Network Virtualization, Network Softwarization and Fusion Platform of Computing and Networking | To be issued |
| Oct. 2017 | Opto-electronics and Communications for Future Optical Network | To be issued |
| Sep. 2017 | No special section this issue | |
| Aug. 2017 | Radio Access Technologies for 5G Mobile Communications System | To be issued **soon** |
| Jul. 2017 | Smart Radio and Its Applicationsin Conjunction with Main Topics of SmartCom | To be issued **soon** |
| Jun. 2017 | Visible Light Communications in Conjunction with Topics of ICEVLC 2015 | To be issued **soon** |

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 Communication Quality in Wireless Networks -------

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Communication Quality in Wireless Networks" in the **July 2018 issue**.

With the requirement of evaluating mobile users' quality of experience (QoE) and the appearance of wireless networks accommodating new wireless devices such as Internet of Things (IoT), understanding QoE in wireless networks becomes a challenge. To improve the quality in these wireless networks, it is required to establish efficient network design technologies which enable technical advances in each layer such as MIMO, diversity, access control, wireless resource management, and wireless physical layer security. The integration of these technologies over existing layers and comprehensive treatment of various wireless technologies such as wireless network protocol designs considering user and machines' behaviors should also be considered. For the above mentioned reasons, we call for publications in a special section (scheduled to appear in the July 2018 issue) in order to further promote research activities and related state-of-the-art technologies on communication quality in wireless networks.

## 1. Scope

This special section aims at timely dissemination of research in these areas. Possible topics related to communication quality for wireless networks include, but are not limited to:

- Cross-Layer Wireless Network Design: Wireless Transmission Efficiency Evaluation, Quality of Service (QoS), and Quality of Experience (QoE)
- Communication Quality Enhancement Technologies for Wireless Networks: MIMO, Diversity, Multiplexing, and Wireless Resource Management
- Wireless Network Protocol Design
- Communication Quality for Internet of Things (IoT) and Machine-to-Machine (M2M)
- Wireless Physical Layer Security

## 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 **August 17th, 2017 (JST).** Authors should choose the Communication Quality in Wireless Networks as a "Journal/Section" on the online screen. Do not choose [Regular EB].

**Contact point:**
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## 3. Special Section Editorial Committee

**Guest Editor-in-Chief:** Yukitoshi Sanada (Keio Univ.)
**Guest Editors:** Takahiro Matsuda (Osaka Univ.), Sho Tsugawa (Univ. of Tsukuba)
**Guest Associate Editors:** Kazunori Hayashi (Kyoto Univ.), Suguru Kameda (Tohoku Univ.), Megumi Kaneko (NII), Toru Takahashi (Mitsubishi Electric Corporation), Kentarou Taniguchi (Toshiba), Osamu Muta (Kyushu Univ.), Tomoki Murakami (NTT), Hiraku Okada (Nagoya Univ.), Masahiro Sasabe (NAIST), Daisuke Umehara (Kyoto Institute of Technology)

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* At least one of the authors must be an IEICE member when the manuscript is submitted for review. Invited papers are an exception. We recommend that authors unaffiliated with IEICE apply for membership. For membership applications, please visit http://www.ieice.org/eng/member/OM-appli.html

Call for Papers

## −−− Special Section on Autonomous Decentralized Systems Technologies and Approaches Innovation through Structure Change of Society and Life −−−

The IEICE Transactions on Communications announces a forthcoming section on “Autonomous Decentralized Systems Technologies and Approaches Innovation through Structure Change of Society and Life” to be published in August 2018.
The Autonomous Decentralized Systems (ADS), born in Japan 40 years ago, have technologically evolved in communication networks, information systems, and control systems. It has been applied in many actual systems, and it has progressed in standardization activities. IEICE and IEEE published joint Special Sections on “Autonomous Decentralized Systems” in May 2000, Oct. 2001, Dec. 2005, Sep. 2008, Nov. 2011 and Apr. 2016 cooperating with the International Symposium on Autonomous Decentralized Systems (ISADS). ADS technology has been making tangible improvement, and innovative new research is being reported successively. In particular, it is expected that ADS technology is applied to applications to promote transformation of social infrastructures, including the smart grid, environment management, resilience of system, Internet of Things, autonomous car and train, communication among the mobiles.

The objective of this Special Section is to discuss new technologies and approaches in the extended field of Autonomous Decentralized System through papers. The Special Section solicits novel research results from ADS and its related fields including the extended results of what is presented in the International Symposium on Autonomous Decentralized Systems (ISADS 2017) in March 2017.
NOTE: **The same paper presented in ISADS 2017 cannot be accepted** because IEEE owns the copyrights to all papers in the conference proceedings. If it was originally appeared in ISADS2017, the submitted paper has to be **revised substantially**. It must have a different title and contain new results opening up new vistas. In this case, it is required to place a footnote indicating it clearly, for example, “This work is based on “(full title)”, by (authors' names) which appeared in Proc. IEEE International Symposium on Autonomous Decentralized Systems (ISADS 2017), Bangkok, Thailand, March 2017, ©2017 IEEE.”

1. Scope

This special section aims to identify the following topics for the autonomous decentralized system technology

- Ad-hoc networks and sensor networks
- Advanced network infrastructures and internetworking
- Mobile agent / computer-supported cooperative works
- Network and system security and safety
- Cloud computing and big data analysis
- Internet of Things and Cyber-Physical Systems
- Heterogeneous distributed information / control systems
- Model driven development
- Web services and Web-based application composition
- Assurance, fault tolerance, on-line expansion, on-line-maintenance, and resilience
- Autonomous and decentralized services, including service architecture, protocols, and collaboration
- Distributed and collaborative development, test and maintenance, and development infrastructure of high-quality software systems, cloud computing, and service-oriented architecture
- Modeling and simulation of autonomous services and service-oriented application composition
- Novel applications, including e-business, e-commerce and e-government; telecommunications; information service systems; manufacturing systems; real-time event management; office automation; traffic and transportation control; supply chains; environmental/emergency protection; networked health and medical systems; intelligent home control; embedded systems for automotive and avionics applications
- Service-oriented architecture, design patterns, and application frameworks
- Technologies and applications to promote transformation of social infrastructures, including the smart grid, environment management, resilience of system, Internet of Things, autonomous car and train, communication among the mobiles

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 **September 1, 2017 (JST)**. Authors should choose Autonomous Decentralized Systems Technologies and Approaches Innovation through Structure Change of Society and Life as a "Journal/Section" on the online screen. Do not choose [Regular EB].

**Contact point:** Chisa Takano, Hiroshima City University
Tel: +81-82-830-1673, Fax: +81-82-830-1693, E-mail: eb-isads-editor@mail.ieice.org

3. Special Section Editorial Committee

Guest Editor-in-Chief: Hidenori Nakazato (Waseda Univ.)
Guest Editors: Chisa Takano (Hiroshima City Univ.), Xiaodong Lu (Electronic Navigation Research Institute)
Guest Associate Editors: Satoshi Ohzahata (Univ. of Electro-Comm.), Kinji Mori (Waseda Univ.), Hiroki Suguri (Miyagi Univ.), Masaki Aida (Tokyo Metropolitan Univ.), Yuichi Yagawa (Hitachi), Atsushi Ito (Utsunomiya Univ.), Masayuki Matsumoto (JR East Mechatronics), Hiroaki Morino (Shibaura Institute of Technology), Tadashi Koga (Electronic Navigation Research Institute), Yinong Chen (Arizona State Univ., USA), Farokh B. Bastani (Univ. of Texas at Dallas, USA), Khalid Mahmood (Oakland Univ., USA)

- ✧ Authors must agree to the "Copyright Transfer and Page Charge Agreement" via electronic submission.
- ✧ Please note that if the submitted paper is accepted, all authors, including authors of invited papers, are requested to pay for the page charges covering partial cost of publications.
- ✧ At least one of the authors must be an IEICE member when the manuscript is submitted for review. Invited papers are an exception. We recommend that authors unaffiliated with IEICE to apply for membership. For membership applications, please visit http://www.ieice.org/eng/member/OM-appli.html

Call for Papers

# Special Section on Wireless Distributed Networks for IoT Era

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Wireless Distributed Networks for IoT Era" in the October 2018 issue.

A special section entitled ``Special Section on Wireless Distributed Networks" was published in December 2010. Although six-years has passed since publication, research on Wireless Distributed Networks (WDN) is still being actively pursued. Recently, inter-networking of various physical devices, which is also referred to as ``Internet of Things (IoT)", has been attracting much attention. WDN is growing in significance as a way of implementing the network infrastructure of IoT. In particular, advanced frequency spectrum sharing, resource control for low power consumption, wired and wireless seamless networks for flexible network topology, highly reliable and real-time wireless communication technologies for remote control, ambient intelligence systems and so on are recognized to be key technologies when integrated with WDN to realize IoT. Since the era for proactive implementation of IoT is upon us, a special section on WDN which considers core technologies for IoT will encourage WDN research and development and expand the areas of IoT applications. For these reasons, a special section is being planned (scheduled to appear in the October 2018 issue).

## 1. Scope

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

(1) P**rinciple theories and their application to WDN** (Multi-port information theory, Array signal processing, Bayes theorem, Graph theory, Convex optimization, Game theory, Machine learning, Artificial intelligence )
(2) **Physical layer technologies of WDN for IoT** (Distributed synchronization, Multi-hop relay, Cooperative relay, Network MIMO, Network coding, Adaptive filter and interference cancellation, Distributed coding)
(3) **MAC layer technologies of WDN for IoT** (Spectrum sensing, Cognitive radio, Dynamic spectrum access technologies, Spectrum data based, Distributed resource control, Spectrum shaping)
(4) **Network layer technologies of WDN for IoT** (Edge computing, SDN, NFV, Network virtualization, Traffic control, Performance evaluation for networks, Network control, Multi-hop wireless routing)
(5) **IoT application technologies with WDN** (Location information technology, Agriculture, forestry, and fisheries support system, Healthcare system, Disaster-prevention and mitigation system, Smart space, Industrial support system, Social infrastructure system, Wide area sensing system, Wireless communications and network for reliable control, Factory Automation, Energy network, Traffic network, Distributed algorithm for multi-agent system)
(6) **Multi-layer technologies of WDN for IoT** (Network handover, Heterogeneous networks, Self-organized networks)

**A submitted paper should be related to WDN. Otherwise, the editorial committee decides it as out of scope in this special section.**

## 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 **November 2, 2017 (JST)**. Authors should choose the Wireless Distributed Networks for IoT Era as a "Journal/Section" on the online screen. Do not choose [Regular EB].

**Contact point:**
**Osamu Takyu**
**Graduate School of Science and Technology, Shinshu University**
**Tel: +81-26-269-5255, E-mail: sr_ac-eb-wdn_for_iot@mail.ieice.org**

## 3. Special Section Editorial Committee

**Guest Editor-in-Chief:** Kazuhiro Uehara (Okayama Univ.)
**Guest Editors:** Osamu Takyu (Shinshu Univ.) Kazuto Yano (ATR)
**Guest Associate Editors:** Masayuki Ariyoshi (NEC), Kenichi Higuchi (Tokyo Univ. of Science), Koji Ishii (Kagawa Univ.), Toshinori Kagawa (NICT), Keiichi Mizutani (Kyoto Univ.), Katsuhiro Naito (Aichi Inst. of Tech.), Satoshi Ohzahata (Univ. of Electro-Commun.), Yukitoshi Sanada (Keio Univ.), Shigeki Shiokawa (Kanagawa Inst. of Tech.), Kazuya Tsukamoto (Kyushu Inst. of Tech.), Norio Yamagaki (NEC), Takuro Yonezawa (Keio Univ.)

* Authors must agree to the "Copyright Transfer and Page Charge Agreement" via electronic submission.
* Please note that if the submitted paper is accepted, all authors, including authors of invited papers, are requested to pay for the page charges covering partial cost of publications.
* At least one of the authors must be an IEICE member when the manuscript is submitted for review. Invited papers are an exception. We recommend that authors unaffiliated with IEICE apply for membership. For membership applications, please visit http://www.ieice.org/eng/member/OM-appli.html

Call for Papers

# ------- Special Section on Recent Progress in Antennas and Propagation in Conjunction with Main Topics of ISAP2017 -------

The IEICE Transactions on Communications announces "Special Section on Recent Progress in Antennas and Propagation in Conjunction with Main Topics of ISAP2017" in **February 2019**. The objective of this special section is to publish recent research results on antenna and propagation technologies related to the topics in ISAP2017 (2017 International Symposium on Antennas and Propagation). The ISAP2017 will be held in Phuket, Thailand during October 30 – November 2, 2017, which provides an international forum for exchanging recent information on progress of the researches. The special section has been planned to publish papers on progressed discussion in ISAP2017. Submissions are available particularly from, but not limited to, the authors in the symposium.

## 1. Scope

This special section aims at timely dissemination of progressing research fields in ISAP2017. Possible topics include antennas and propagation technologies such as antenna design techniques, 5G mobile communication systems, MIMO, millimeter-wave/THz/optical applications, and wireless power transmission. The topics also include electromagnetic wave theory and computational methods for various electromagnetic topics including metamaterial, nano-electromagnetics, image sensing and their applications. However, the field of papers submitted to this special section is not limited to the above topics.

## 2. Submission Instructions

The standard number of pages is 8. The page charges are considerably higher for extra pages. Submissions of “letters” are not accepted. 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 period 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 only papers by electronic submission. Submit a manuscript and electronic source files (LaTeX/Word files, figures, authors’ photos and biography) via the IEICE Web site https://review.ieice.org/regist/regist_baseinfo_e.aspx **by February 15th, 2018 (JST)**. Authors should choose the Recent Progress in Antennas and Propagation in Conjunction with Main Topics of ISAP2017 as a "Journal/Section" on the online screen. Do not choose [Regular-EB].

**Contact Person:** Yuichi Kimura
Graduate School of Science and Engineering, Saitama University
**Email:** ap_ac-isap2017ss@mail.ieice.org

## 3. Special Section Editorial Committee

**Guest Editor-in-Chief:** Monai Krairiksh（KMITL）
**Deputy Editor-in-Chief:** Jiro Hirokawa (Tokyo Tech)
**Guest Editors:** Chuwong Phongcharoenpanich (KMITL), Takeshi Fukusako (Kumamoto Univ.), Yuichi Kimura (Saitama Univ.)
**Guest Associate Editors:** Prayoot Akkaraekthalin (KMUTNB), Danai Torrungrueng (Asian Univ.), Takuji Arima (Tokyo Univ. of Agric. and Tech.), Shin-ichi Ichitsubo (Kyushu Inst. of Tech.), Yoshio Inasawa (Mitsubishi Electric), Hisato Iwai (Doshisha Univ.), Naoki Kita (NTT), Eisuke Nishiyama (Saga Univ.), Masayuki Nakano (KDDI Research), Naoki Honma (Iwate Univ.), Ryo Yamaguchi (Softbank), Manabu Yamamoto (Hokkaido Univ.)

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* Please note that if accepted, all authors, including authors of invited papers, are requested to pay for the page charges covering partial cost of publications.
* At least one of the authors must be an IEICE member when the manuscript is submitted for review. Invited papers are an exception. We recommend that authors unaffiliated with IEICE apply for membership. For membership applications, please visit the web-page, http://www.ieice.org/eng/member/OM-appli.html.

## *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.

**OMDP (Overseas Membership Development Program):** OMDP is provided for candidates **from countries/areas in Asia(except Republic of Korea and Taiwan), Africa, Central America, and South America.** This program is designed so that IEICE can contribute to and support the progress of science and technology throughout the world. Scientists and engineers in these countries/areas are encouraged to apply to the program.

### ● 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)**

| | | Online Version | | Paper Version (optional) |
|---|---|---|---|---|
| Service coverage for overseas members | Admission charge | 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.*

**4. If you want to change membership from Member (In Japan) to Overseas Member, you don't need to pay an Entrance charge.**

### ● Optional Rapid Mailing Service

Surface mail charge is included in the membership charge. Optional rapid mailing service is available by air mail or surface air lifted (SAL) mail. The additional charge per year periodical depends on the mailing address, as shown in the right table.

| 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 Overseas Membership Application Form

**URL** http://www.ieice.org/eng/member/OM-appli.html **E-mail** member@ieice.org **FAX** +81-3-3433-6659

◆ **Please type or print in English. The deadline for submitting application form is the 1st day of every month.**

## Personal Information

***Full name:*** _____ ***Nationality:*** _____ ☐Male ☐Female
First name Middle name Last name

☐Prof. ☐Dr. ☐Mr. ☐Ms. ***Place of birth:*** _____ ***Date of birth:*** _____
Day Month Year

## Mailing Address ☐Home ☐Office

Name of Company/School/College Department/Section

Street City State/Province

Postal code Country

TEL FAX E-mail

## Academic Background The highest academic degree: ☐Ph.D. ☐Masters ☐Bachelors ☐Others: _____

University/college/school of the highest academic degree Month & year of graduation

**(For Student Member)** Academic degree which will be conferred on you Month & year when the degree will be conferred on you

## Application Information

***Membership:*** I want to apply for the following membership (check one item!)

☐Member (Overseas) ☐Student Member (Overseas)

◆If you want to apply for OMDP, please check; ☐OMDP (Overseas Membership Development Program)

***Society registration (Membership fee includes one Society of Transaction of Online version.):***

☐A: Engineering Sciences ☐B: Communications ☐C: Electronics ☐D: Information and Systems

**Additional Society (optional):** ☐A: Engineering Sciences ☐B: Communications ☐C: Electronics ☐D: Information and Systems

**Additional Transactions of paper version (optional):**

☐EA: Fundamentals ☐EB: Communications ☐EC: Electronics ☐ED: Information and Systems

☐A: Fundamentals (Japanese) ☐B: Communications (Japanese) ☐C: Electronics (Japanese) ☐D: Information and Systems (Japanese)

**Journal subscription (optional):** ☐(Japanese)

## Remittance Remittance is available only in *Japanese yen* by a *credit card*.

Admission charge……¥_____ Journal subscription (optional)……..¥ _____

Annual charge……¥_____ Mailing option: ☐Air mail……..……¥ _____

Additional Society (optional) …… ¥_____ ☐SAL mail……¥ _____

Additional Transactions (optional)……..…¥_____ **Total……..……¥** _____

Credit Card: ☐UC ☐Master Card ☐VISA ☐JCB ☐American Express

Card number: | | | | | | | | | | | | | | | | |

Expiry date: _____/_____ Credit Card Holder: _____ Signature: _____
Year Month

## Endorsement *Endorsements by one IEICE Member application is required. If it is difficult to find endorsers, please contact the IEICE Membership Activities Section by sending this sheet, and we will help you.*

I recommend this applicant for IEICE membership.

Endorser's name Membership number Endorser's signature Date

# 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)

# IEICE Communications Society - GLOBAL NEWSLETTER Submission Guideline

First version in only Japanese: May 30, 2008
Second version in only Japanese: Feb. 13, 2009
Third version in only Japanese: Jul. 22, 2010
Forth version in English and Japanese: Mar. 8, 2011
Ver 5.0 : August 10 2013

## 1. About GLOBAL NEWSLETTER

The Institute of Electronics, Information and Communication Engineers Communications Society (IEICE-CS) GLOBAL NEWSLETTER has been established since 2002. We quarterly publish an English newsletter every March, June, September, and December.

### 1.1. Goal

Our goal is to share information between overseas/foreign members and other members in IEICE-CS as a global activity, and to show IEICE presence internationally.

### 1.2 Category of Articles

1) Messages from President/Vice President
   - An inaugural message from CS President is published once per year in June. Message from CS Vice President is published properly.
2) IEICE-CS Activities Now
   - IEICE General/Society Conference information/reports
   - Activities of Technical Committees
   - International activities of the society
3) IEICE-CS Related Conferences Reports
   - Information/reports on IEICE-CS related conferences
   - IEICE-CS Conferences Calendar (*)
4) Others
   - Essays, Laboratory activity reports, Technology reports, Messages from overseas/foreign members, etc.
   - Information from Sister Societies
   - Special topics (*)
5) IEICE-CS Information
   - Call for papers
   - From editor's desk (*)

*: planned / written by IEICE-CS Directors, Planning and Members Activities

## 2. Major notes for Contribution

Basically, IEICE-CS members and readers can contribute articles. IEICE-CS Directors, Planning and Members Activities may ask non-IEICE-CS members to contribute articles. The articles should be fruitful and profitable for IEICE-CS members, **NOT** for particular organization. IEICE-CS Directors, Planning and Members Activities may not accept an article for publication if it does not follow this guideline.

### 2.1 Template and Language

Please use template downloadable at the URL:
http://www.ieice.org/cs/pub/global_howto.html
Please use English for all articles.

### 2.2 Number of pages

Two to four pages are preferable. One page article is also acceptable. The maximum number of pages is eight. When you try to entry a contribution with five to eight pages, you need to negotiate with IEICE-CS Directors, Planning and Members Activities.

## 3. Copyright

The copyrights of all articles in the GLOBAL NEWSLETTER should belong to the IEICE. However, the original authors retain the right to copy, translate or modify their own manuscripts. In cases when a manuscript is translated into another language or when any portion of the manuscript is to be submitted to another publication, authors

should register the action with the IEICE, and the original manuscript should be clearly cited in the publications. Please see a web site related to IEICE provisions on copyright.
http://www.ieice.org/eng/copyright/index.html

**4. Publication fee / Manuscript fee**
No publication fee and no manuscript fee for all articles.

**5. Schedule**
Standard editing schedule is as follows. Please note that the schedule may vary due to public holidays or other circumstances. The exact deadlines are indicated in call for newsletters.

| | | | | |
|---|---|---|---|---|
| Publication date | 1st , Mar. | 1st, Jun. | 1st, Sept. | 1st, Dec. |
| Call for newsletters | 1st Mon., Dec. | 1st Mon., Mar. | 1st Mon., Jun. | 1st Mon., Sept. |
| Contribution entry | 4th Fri., Dec. | 4th Fri., Mar. | 4th Fri., Jun. | 4th Fri., Sept. |
| Submission of Manuscript/Copyright | 3rd Fri., Jan. | 3rd Fri., Apr. | 3rd Fri., Jul. | 3rd Fri., Oct. |

**5.1 Call for Newsletters**
IEICE-CS Directors, Planning and Members Activities will give you the information on call for newsletters.

**5.2 Contribution Entry**
You should send **information on title, summary(around 50 words or less) and number of page** to IEICE-CS Directors, Planning and Members Activities by e-mail.
E-mail: cs-gnl@mail.ieice.org

**5.3 Submission of Manuscript**
You should send a manuscript both in word file and pdf file to IEICE-CS Directors, Planning and Members Activities by e-mail.
E-mail: cs-gnl@mail.ieice.org

**5.4 Submission of COPYRIGHT TRANSFER FORM**
COPYRIGHT TRANSFER FORM can be downloaded at:
http://www.ieice.org/cs/pub/global_howto.html
Signed **COPYRIGHT TRANSFER FORM** should be sent by one of the following ways:
- By email.
- By facsimile.

Address to send:
- In case of email: cs-gnl@mail.ieice.org
- In case of facsimile:
  Name: Publications Department, IEICE
  Facsimile: +81-3-3433-6616, Phone: +81-3-3433-6692

**6 Contact Point**
IEICE-CS Directors, Planning and Members Activities in charge of IEICE-CS GLOBAL NEWSLETTER, cs-gnl@mail.ieice.org

# From Editor's Desk

## ● Leaving GNL Editor's Desk

I had joined Director, Planning and Member Activities, IEICE-CS, and started editing IEICE-CS GLOBAL NEWSLETTER (GNL) at 2014. Since that time, I was involved twelve issue with a lot of articles, and I got a lot of valuable experiences through editing of this magazine. This Vol. 41, No. 2 (issued on June 1) is my last volume as an editorial staff of GNL. From the next issue, the new team of Editorial Staffs will make the future GNL more interesting and exciting one. GNL will continue to be improved so that it will become a better magazine. I am looking forward to everyone of you to keep enjoying GNL.

IEICE-CS GLOBAL NEWSLETTER Editorial Staff

**Editorial Staff of this issue**

No special order is observed.

**Moriya NAKAMURA**
Meiji University
Department of Electronics and Bioinformatics, School of Science and Technology
*Director, Planning and Member Activities, IEICE Communications Society*

**Manabu KAI**
Fujitsu Laboratories, Ltd.
Network Systems Laboratory
*Director, Planning and Member Activities, IEICE Communications Society*

**Takashi DATEKI**
Fujitsu Laboratories, Ltd.
Network Systems Laboratory
*Director, International Publication, IEICE Communications Society*

# 2017 IEEE CAMA

## 4 - 6 December, 2017

## AIST, Tsukuba, Ibaraki, Japan

## 2017 IEEE Conference on Antenna Measurements & Applications

## http://www.2017ieeecama.org

**The venue is AIST (National Inst. of Advanced Industrial Science and Tech.)**
**The AIST (https://www.aist.go.jp/index_en.html) is located in Tsukuba, one hour from Narita airport by direct shuttle bus service and one hour to Tokyo by Tsukuba Express railway.**

Picture provided by Ibaraki Prefectural Tourism & Local Products Association

## Organizing Committee:

*General Chairs*

Satoru Kurokawa (AIST, Japan)

Nozomu Ishii (Niigata Univ., Japan)

*TPC Chairs*

Claire Migliaccio (Univ. Nice Sophia Antipolis, CNRS, France)

Takayuki Sasamori (Akita Prefectural Univ., Japan)

*International Advisory Committee Chairs*

Christian Pichot (Univ. Nice Sophia Antipolis, CNRS, France)

Hiroyuki Arai (Yokohama National Univ., Japan)

## Important Dates:

Submission Deadline for Regular Session: **1 August, 2017**

Submission Deadline for Special Session: **15 August, 2017**

Notification of Acceptance: **22 September, 2017**

## Suggested Technical Topics:

- Antenna Measurements in Non-anechoic Environments,
- Frequency versus Time-Domain in Antenna Measurements
- Multi-antenna System Measurements (Spatial Diversity)
- New Measurement Methods and Systems
- RF Material Characterization and Radomes
- Novel Near-Field to Far-Field Transformations
- Inverse & Imaging Techniques
- Super Resolution Algorithms and Processing
- Antenna Calibration, Uncertainty Analysis
- Applications:Telecommunications, Biomedical, Satellites, Industrial, Civil Engineering, Geophysics, Homeland Security

## Location of Tsukuba City:


Sponsored by

IEEE

APS

Technically Co-sponsored by

AIST

IEICE Communications Society


## Call for Papers

### *International Conference on Renewable Energy Research and Applications, ICRERA-2017*

Dear Colleague,

The purpose of the International Conference on Renewable Energy Research and Applications (ICRERA) 2017 is to bring together researchers, engineers, manufacturers, practitioners and customers from all over the world to share and discuss advances and developments in renewable energy research and applications.

After the successes of the first, the second, the third, the fourth and the fifth editions of ICRERA in Nagasaki (2012), Madrid (2013), Milwaukee (2014), Palermo (2015), Birmingham (2016) and the sixth ICRERA in San Diego, CA, USA will continue promoting and disseminating the knowledge concerning several topics and technologies related to renewable (green) energy systems and sources. ***It is our happiness to share with you that 87 selected papers out of 372 papers at ICRERA2016 have been proposed for possible publications in IEEE Transactions on Power Electronics (27 papers), IEEE Transactions on Industrial Applications (19 papers), and International Journal of Renewable Energy Research (29 Papers), Environmental Science and Pollution Research (12).*** We hope to select same number of papers for the ICRERA2017. Up to now, all papers presented at ICRERA conferences have been published in IEEE Xplore and Thomson Reuters.

ICRERA aims to present important results to the international community of renewable energy fields in the form of research, development, applications, design and technology. It is therefore aimed at assisting researchers, scientists, manufacturers, companies, communities, agencies, associations and societies to keep abreast on new developments in their specialist fields and to unite in finding alternative energy solutions to current issues such as the greenhouse effect, sustainable and clean energy issues.

Topics within the scope of the conference include the following areas, but not limited to:

- Renewable (Green) Energy Systems and Sources (RESSs) as Wind Power, Hydropower, Solar Energy, Biomass, Biofuel, Geothermal Energy, Wave Energy, Tidal energy, Hydrogen & Fuel Cells, Energy Storage
- New Trends and Technologies for RESSs
- Policies and Strategies for RESSs
- Energy Transformation from Renewable Energy System (RES) to Grid
- Novel Energy Conversion Studies for RESs
- Power Devices and Driving Circuits for RESs
- Control Techniques for RESs
- Grid Interactive Systems Used in Hybrid RESs
- Performance Analysis of RESs
- Hybrid RESSs
- Decision Support Systems for RESSs
- Renewable Energy Research and Applications for Industries
- RESSs for Electrical Vehicles and Components
- Artificial Intelligence and Machine Learning Studies for RESs and Applications
- Computational Methods for RESSs
- Energy Savings for Vehicular Technology, Power Electronics, Electric Machinery and Control, etc.
- New Approaches in Lightings
- Public Awareness and Education for Renewable Energy and Systems

- Reliability and Maintenance in RESSs
- Smart grids and RESSs
- Safety and Security of RESSs
- Renewable Energy Systems in Smart Cities
- Future Challenges and Directions for RESSs

Long Digest Submission: IEEE format, minimum 3 - 5 pages, including figures

Selected papers will be published in following journals cited in SCI with higher impact factors.

- IEEE Transactions on Power Electronics,
- IEEE Transactions on Industrial Applications,
- International Journal of Renewable Energy Research
- Environmental Science and Pollution Research.

**ICRERA 2017 Author Deadlines:**

| | |
|---|---|
| 3 to 5 Pages Long Digest Submission Deadline: | June 15, 2017 |
| Notification of acceptance: | August 31, 2017 |
| Final submissions due: | October 1, 2017 |
| Dates for Conference: | November 12-15, 2017 |

**Invitation**:

On behalf of organizing committee, we would like to invite you to submit articles to ICRERA 2017. Proposals for special sessions, workshops, tutorials, challenges, competitions, etc. are most welcome.

**Awards:**

Awards will be provided to some Outstanding Paper and some Student Excellent Presentation selected and conferred by the ICRERA 2017 Program Committee. In order to qualify for the award, the paper must be presented at the conference.

Best regards,

**Prof. Yusuf OZTURK**
**General Chair, ICRERA**
**SAN DIEGO STATE University, CA, USA**

**Prof. ILHAMI COLAK**
**General Co-hair, ICRERA**
**Nisantasi University**

**Prof. FUJIO KUROKAWA**
**General Co-Chair, ICRERA**
**NAGASAKI University**

www.icrera.org ; icrera@gmail.com

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# CALL FOR PAPERS

*Bridging the Metropolitan and the Remote*

**December 11-13, 2017 Perth, Western Australia, Australia**

## The 23rd Asia-Pacific Conference on Communications

**www.apcc2017perth.org**

The 23rd Asia-Pacific Conference on Communications (APCC2017) will be held in Perth, Western Australia, Australia, a vibrant, yet easy-going city surrounded by natural attractions. Since 1993, APCC has been the forum for researchers and engineers in the Asia-Pacific region to present and discuss about advanced information and communication technologies and services, while opening the door to the world at the same time. The theme of APCC2017 is "Bridging the Metropolitan and the Remote".

Prospective authors are invited to submit original technical papers for presentation at the conference and publication in the conference proceedings. Papers must be written using the IEEE conference proceedings style format (two-column and 10-point font) with a maximum length limit of 6 pages. All accepted papers of APCC2017 will be submitted to IEEE Xplore.

**Important Dates**

| | |
|---|---|
| Paper Submission Deadline | Jun. 1, 2017 |
| Acceptance Notification | Aug. 31, 2017 |
| Camera Ready Submission & Author Registration | Sep. 30, 2017 |
| Early Bird Registration Deadline | Oct. 20, 2017 |
| Conference Dates | Dec. 11-13, 2017 |

*Perth is the most isolated major city in the world, and is truly unique.*

*APCC 2017 will be held on 11-13 December 2017, following Globecom 2017 (4-8 December) in Singapore, one of the closest cities to Perth. Within twelve years since 2005, APCC 2017 will be the only international conference on communications in Perth.*

*Come and see what happens in Perth! Come and help solve the challenges of the remote areas now. Do you want to wait for another twelve years to come?*

HUAWEI Curtin University THE UNIVERSITY OF WESTERN AUSTRALIA

IEEE Western Australia Section PERTH CONVENTION BUREAU IEICE Communications Society KICS 中国通信学会 CHINA INSTITUTE OF COMMUNICATIONS


# Call for Papers

**http://www.cnsm-conf.org/2017/**

The 13th International Conference on Network and Service Management (CNSM) is inviting authors to submit original contributions in the network and service management research area. CNSM 2017 is a selective single-track conference, covering all aspects of the management of networks and services, pervasive systems, enterprises, and cloud computing environments. The core track is accompanied by a series of workshops and poster sessions.
CNSM is technically co-sponsored by IEEE Communications Society, IFIP and IEICE ICM.

## Topics of Interest (but not limited to)

**Network Management**

- Software-defined networks
- Virtual networks
- Overlay networks
- Wireless networks and cellular networks
- Wireless sensor networks
- Internet of Things networks
- Information-centric networks
- Enterprise networks and campus networks
- Data center networks
- Optical networks
- IP networks
- Home networks
- Access networks
- SCADA networks and distributed control systems
- Smart Cities and Smart Grids

**Management Paradigms**

- Centralized management
- Distributed management
- Hierarchical management
- Federated management
- Autonomic and cognitive management
- Policy-based management
- Pro-active management
- Energy-aware management
- Quality of experience-centric management

**Service Management**

- Cloud computing services
- Content delivery services
- Multimedia services
- Internet connectivity and Internet access
- Internet of Things services
- Security services
- Context-aware services
- Information technology services

**Business Management**

- Economic aspects
- Multi-stakeholder aspects
- Service level agreements
- Lifecycle aspects
- Process and workflow aspects
- Legal perspective
- Regulatory perspective
- Privacy aspects

**Functional Areas**

- Deployment management
- Fault management
- Configuration management
- Accounting management
- Performance management
- Security management

**Management Technologies**

- Network function virtualization
- Software-defined networking
- Orchestration
- Cloud computing and cloud storage
- Communication protocols
- Middleware
- Data models, information models semantic models
- Operations support systems and business support systems
- Information visualization

**Methods**

- Mathematical optimization
- Control theory
- Probability theory, stochastic processes, and queuing theory
- Machine learning
- Evolutionary algorithms
- Economic theory and game theory
- Mathematical logic and automated reasoning
- Data mining and (big) data analysis
- Monitoring and measurements
- Computer simulation experiments
- Prototype implementation and testbed experimentation
- Field trials

Authors are invited to submit original contributions that have not been published or submitted for publication elsewhere. Papers should be prepared using the IEEE 2-column conference style and are limited to 8 pages excluding references (full papers) or 4 pages excluding references (short papers). They have to be submitted electronically in PDF format through EDAS. Papers exceeding page limits, multiple submissions, and self-plagiarized papers will be rejected without further review. All other papers will sustain a thorough single-blind review process, followed by a rebuttal phase.
Papers accepted and presented at CNSM 2017 will be published open access on the conference Web site and will be submitted for possible inclusion in IEEE Xplore and IFIP Digital Libraries. Authors of selected papers accepted for publication in CNSM 2017 proceedings will be invited to submit an extended version of their papers to the IEEE Transactions on Network and Service Management journal.

For more information please check

http://www.cnsm-conf.org/2017/

### Important Dates

**Paper Submission:** June 12, 2017
**Rebuttal Phase:** Aug. 6-12, 2017
**Acceptance Notification:** Aug. 27, 2017
**Camera Ready due:** Oct. 7, 2017
**Conference:** Nov. 26 – 30, 2017

### General Co-Chairs:

Yoshiaki Tanaka, Waseda Univ., Japan
Yoshiaki Kiriha, The Univ. of Tokyo, Japan

### Vice Chair:

Shingo Ata, Osaka City Univ., Japan

### Technical Program Co-Chairs:

Carol Fung, Virginia Commonwealth Univ., USA
Kazuhiko Kinoshita, Tokushima Univ., Japan
Steven Latré, Univ. of Antwerp - imec, Belgium


# 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 Smart Computing
- Other Services and Applications for ICT Convergence

## SUBMISSIONS:

ICTC 2017 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 http://edas.info/N23420. 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://www.ictc2017.org).

## KEYNOTE SPEAKERS and SPECIAL TALKS:

During ICTC 2017, 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 2017 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 Information Journal (Scopus), ICT Express, and KICS Journal after an express review and further revisions.

## BEST PAPER AWARDS:

ICTC 2017 will present the Best Paper Awards to the authors of selected outstanding papers.

## IMPORTANT DATES

- Paper Submission Deadline: June 30, 2017
- Notification of Acceptance: August 18, 2017
- Camera Ready Deadline: September 1, 2017
- Author Registration Deadline: September 1, 2017

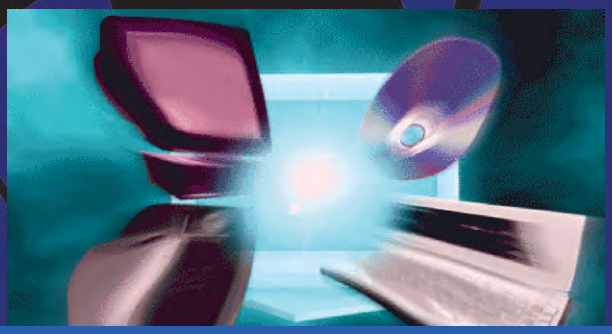
**For any inquiries on ICTC 2017, please contact**

ictc@kics.or.kr

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

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

# IEICE Communications Society



## IEICE Society Conference 2017

### 12-15 September 2017
### Tokyo City University, Tokyo

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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