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# My Life as a Researcher

Shigeru Tomita  
NTT Advanced Technology Corporation



## 1. Introduction

Long time ago, when I was playing in the kindergarten, I dreamed to become a train driver or a super hero like Ultraman. (It is famous Superhero like Superman in US) After that, when I entered to a primary school, my dream changed to become a professional baseball player. However, in those days, my eye vision began to degrade and I had to wear glasses, I gave up a dream to be an athlete. In days of junior high school, I began to play a keyboard in Rock'n Roll band. I thought that I wanted to be a composer or a piano player in music business area. When I entered to a high school, I had shocked by a man who played piano very well. He became a professional piano player and he is still working well in the musical business area. With above processes, I decided to go to the engineering department of the university when I was at 3<sup>rd</sup> grade in the high school. With another word, I started to walk toward a practical future target. When I was 4<sup>th</sup> grade of the university, Professor came to me and said "It is better to have a job in NTT Laboratories, because I think that you can do well in such area". At that time, I thought that I wanted to get a job in TV business. However, I decided to believe Professor's suggestion. Up to now, I could not recognize the reason why I do so. Anyway, I started a life as a researcher at NTT Laboratories in 1983.

## 2. Researcher Life in NTT

### 2.1 Preparation

When I was entering NTT Laboratories, I did not know about jobs of a researcher well. I merely expected to be able to study optical fibers and their related characteristics, because I had studied on that area in university era. At first, I had studied on an estimation method about pulling force of telecommunication cables into ducts that had several curve portions on its route. I had recognized that estimating elongation on optical fiber during installation is very important to estimate its lifetime, because optical fiber is made of glass. However, in those days, I thought that I wanted to be study on transmission characteristics of optical fibers. Anyway, I learned mechanical characteristics of optical fibers and the way to write research papers.

### 2.2 Big Project

In 1985, NTT announced that optical fibers would be installed in access networks in the late 80s. For this purpose, optical fiber ribbons and high fiber count

cables had been developed. Fortunately I had been joined this big project in its early stage. I was assigned to development team of high count optical fiber cables. Optical fiber ribbon is a kind of coated fiber. Figure 1 shows a cross-section of an optical fiber ribbon (four fiber ribbon) [1]. Four coated optical fibers are unified by using an outer coating material. Each coated optical fiber is 0.25 mm in diameter, and so the distance between adjacent optical fibers is 0.25 mm.

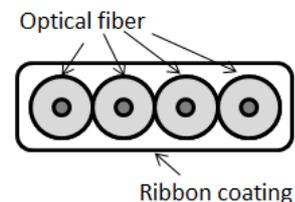


Fig. 1 Cross-section of 4-optical fiber ribbon

The slotted rod cable was invented to accommodate the optical fiber ribbon. For example, the cross-section of 1000-optical fiber cable is shown in Fig. 2. The cable consists of one hundred and twenty-five 8-fiber ribbons, a tensile member, LAP tape and a sheath. Five 8-fiber ribbons are stacked and accommodated in each slot. Each slotted rod has five slots, giving the cable a total of twenty-five slots.

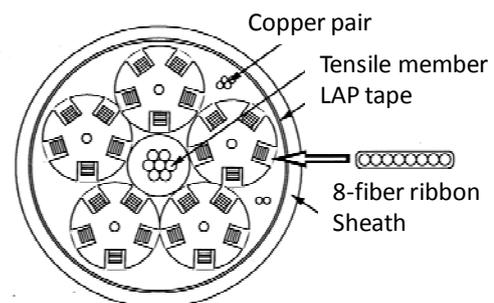


Fig. 2 1000-optical fiber cable

At that time, to prevent water penetration, optical fiber cables were filled with high-pressure gas in the same way as metallic cables. LAP (laminated aluminum) tape works to protect the sheath from such high-pressure gas.

A few years later, a new optical fiber cable structure was developed. Figure 3 shows a cross-section of a 1000-optical fiber water blocking cable. Single slotted rod and water blocking tape have been applied newly to increase fiber density.

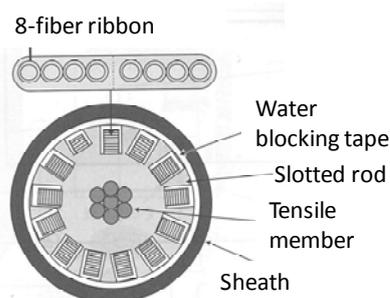


Fig. 3 1000-optical fiber water-blocking cable

With metallic cables, a short circuit may be caused if they are penetrated by water. With optical fiber cables, this kind of immediate problem does not occur. However, when optical fibers are submerged for a long time, it is known that their long-term reliability will be degraded. To prevent this degradation, water-blocking materials have been developed for cables. Figure 4 shows the structure of water blocking tape [2].

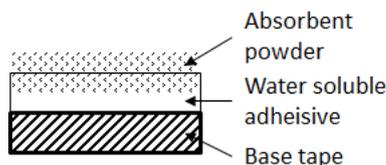


Fig. 4 Water-blocking tape

A water-blocking tape consists of absorbent powder whose volume increases as it absorbs water, water-soluble adhesive and a base tape. The water soluble adhesive holds the absorbent powder in place. When water seeps into the cable as a result of cable sheath damage, the water-soluble adhesive dissolves. Then the absorbent powder is released and spreads rapidly into the empty spaces in the cable. The absorbent powder combines with water to form a gel and is able to absorb 1000 times its own volume. The empty spaces are filled as the volume of the absorbent powder increases. Then water penetration is halted once the empty spaces are filled. This mechanism has been installed in optical fiber cables in Japan since 1989. After that, we had tried to develop 4000-fiber cable. However, it has been stopped, because such a high fiber count cable has not been needed for access network by using PDS (Passive Double Star) system. 20 years after from joining in NTT laboratories, I was moved to NTT headquarters.

### 2.3 Changes in Viewpoint and Stance

I spent two years in NTT headquarter. During those years, discussion on Photonic crystal technologies had been started among the optical fiber related engineers. Photonic crystal technologies means, by using three dimensional structure which size nearly equal to optical wave length several effects are induced on optical ray. In optical fiber world, it was thought that some kind of functions will be produced by holes which are aligned horizontally to core. When I designed optical fiber cables, radii of optical fiber in the cable was a part of main issues. Because attenuation of optical fiber

increase with small radii. I thought that holes which located surrounding of core may solve this problem. Holes can reduce effective refractive index of cladding. Increase of refractive index difference between core and cladding causes reduce of attenuation when fiber is bent. I worked at the head office at that time, so I decided to leave this research to my colleagues in laboratory and friends in Hitachi-Cable (an optical fiber cable supplier). As a result, this type of fiber had been used for termination optical fiber cables in subscriber house [3]. From 2007 to 2013, sales amount of this termination cables became about 4 million pieces in Japan, and about 600 thousand pieces in south east Asia. It was a great pleasure for me to win the achievement award of the Institute of Electronics, Information and Communication Engineers in 2013 and the Minister of Education, Culture, Sports, Science and Technology's award in 2017 by the invention of this cable.

### 3. Pure Researcher and Professional Researcher

I think that a researcher who will find research themes according to his mind can be called "Pure researcher". On the other hand, a researcher who was given research themes by employer or someone can be called "Professional researcher". It is thought that the former seems to be having more fun and joy through the research process. I am the latter one. Even if so, I was greatly enjoyed my researcher life in NTT. There were many new inventions, funs, new experiences and good colleagues. Even if the bad (or not expected) results were caused in the calculation or test, these results lead new knowledge to us. I think that I was happy that I was a professional researcher.

### 4. Epilogue

In 2012, I moved to the NTT Advanced Technologies Corporation. After that, I had been worked on business which is not related to optical fiber cables. However, since two years ago, I am engaged in quite a new optical fiber production. Although it is not research, I can take advantage of my old knowledge in sometimes, and I am enjoying it. In Japan, it is said that getting older makes their mind return to child. As they said, I dream that my duty will be return to development or research position from management position. If I can return to more early days, I hope to play music in a Rock'n Roll band forever.

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# From Study to Work in Japan: A Choice Changed My Lifestyle

Hailan Peng  
KDDI Research, Inc.



## 1. Introduction

This article briefly introduces my study and work in Japan, as well as my life as a foreigner during these periods. Before I came to Japan, I received my bachelor and master degree from Beijing University of Posts and Communications, China. During my master study, I had worked for half a year in DOCOMO Beijing Communications Laboratories as an intern. Just because of this intern, I learned the serious Japanese academic spirit, interesting Japanese culture and all kinds of festivals from my colleagues and mentor. It inspired me with great interest in pursuing my further study in Japan.

## 2. Study in UEC

I arrived in Japan on 1<sup>st</sup> Oct. 2009, when I received Japanese Government Scholarship (Monbukagakusho: MEXT) and started my Ph.D. course at Fujii Laboratory, Advanced Wireless Communication research Center (AWCC), The University of Electro-Communications (UEC).

I cannot speak Japanese before I came to Japan. Thanks to my supervisor, Prof. Takeo Fujii, who speaks fluent English and is very nice. He not only supervised my research, but also helped me a lot in my life. My research in Fujii Laboratory mainly focused on studying the coexistence and resource sharing between cellular primary networks (i.e. existing cellular networks) and cellular cognitive radio networks (i.e. secondary networks). As shown in Fig. 1, active subbands are allocated to primary users (PUs) in primary networks. The inactive subbands will be wasted if there are no PUs utilized. However, the frequency sharing by secondary users (SUs) can improve spectrum efficiency but cause interference to PUs as well. Therefore, to improve spectrum efficiency, enable coexistence of primary/secondary networks, and avoid unacceptable interference at the same time, a joint resource allocation and interference avoidance algorithm for a single-cell multi-user cognitive radio network was proposed in [1]. Moreover, multi-cell multi-user cases were also studied and a distributed power and subchannel allocation scheme using a novel intra-cell spectrum overlay and inter-cell spectrum underlay sharing method was proposed in [2]. To allocate the limited resources optimally, many optimization problems were defined and solved. Mathematical optimization techniques, including convex optimization, integer/ combinatorial optimization, game theory, etc., were utilized in [1, 2].

Besides my research in UEC, the center for Japanese language education of the university provides an opportunity for international students and researchers to

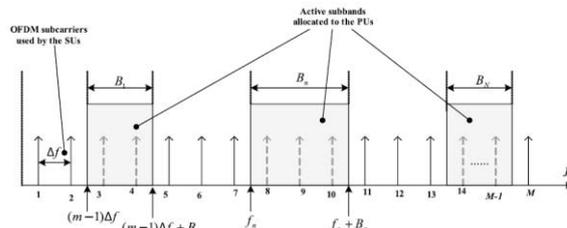


Fig. 1 Subcarriers allocation of PUs and SUs



Fig. 2 Yukata wearing in UEC

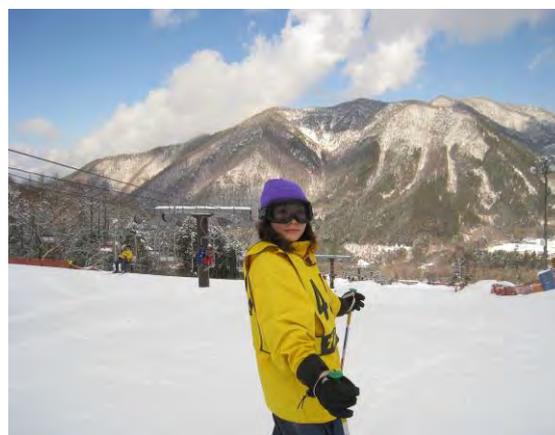


Fig. 3 Skiing tour in Yamanashi-ken

learn Japanese and communicate with each other. The courses in UEC cover not only Japanese learning, but also experiencing all kinds of Japanese culture and festivals, like strawberry hunting in spring, firework festival in summer, Yukata wearing in autumn (Fig. 2), skiing tour in winter (Fig. 3), two times of domestic traveling yearly, etc. Therefore, even though I mainly used English in Fujii Lab. for my research, I still had many chances to speak Japanese in other parts of my life. Thanks to the Japanese course in the university, I can communicate with my colleagues in Japanese without big barriers after I joined KDDI Research.

### 3. Work in KDDI Research

After graduated from UEC, I joined KDDI R&D Laboratories, Inc. since Nov. 2013 (currently KDDI Research, Inc. since Oct. 2016) with the recommendation from Prof. Fujii, working as a Research Engineer in Wireless Communications System Laboratory (WCSL), the Department of Access Networks (currently Next generation Access Networks since Apr. 2017). Because my major is telecommunications from my bachelor, it is really a good chance for me to contribute my knowledge to the society when working in a telecommunication operator.

The research in the company is with significant difference from that in the university. Even though my work still focused on cellular mobile networks, they were changed from cognitive radio networks to Long-Term Evolution (LTE) networks. I am not only undertaking work items in our group for our company, such as 3GPP (3<sup>rd</sup> Generation Partnership Project) standardization activities, but also engaged in an EU-JP international project named MiWEBA (Millimetre-Wave Evolution for Backhaul and Access) [3], which aimed to bring millimeter-wave (mm-wave) technology into the mobile radio world and realize mm-wave access/fronthaul/backhaul links to extend the network capacity by 1000 times at reasonable cost and without loss of convenience to users. In this project, I focused on the research of mm-wave access links and studied the interworking/combination of existing LTE networks and 60GHz mm-wave bands. Through totally understood the 3GPP standards on control plane (C-plane) and user plane (U-plane) procedures, I proposed a novel LTE/WiGig interworking architecture including extended C-plane and U-plane architectures to enable the mm-wave heterogeneous network shown in Fig. 4 [4]. At the same time, a new work item named “LTE-WLAN radio level Integration” was started in 3GPP RAN2 meetings, our proposed architectures also can be applied to LTE-WLAN integration. Therefore, the research results were contributed to this work item in 3GPP and standardized. Even though the mm-wave transmission is proved with better energy efficiency, can decrease inter-cell handover and increase user throughput significantly, it still has a long way forward to practical application.

The research in the industry need to consider both academic value and business value, and the solutions should solve practical problems and contribute to the company’s business. Researchers in my company are encouraged to not only join academic conferences and present their technical papers, but also submit contributions for standardization and file patents.

You may have heard that Japanese companies are with high pressure and long overtime work. However, they still have many systems to help employees to balance their work and life, to support the employees with children. For example, in my company, Wednesday is the no overtime day and everyone need go back home on time. Moreover, it will give employees special holidays, i.e., 5 days per child per year, to take care of their children. The work time is also flexible. These are really

important and convenient to me, since I am not only an employee, but also a mom with two children. I can come to work earlier and go back earlier to prepare and have dinner with them together. After they went to sleep, I can continue my work if there is any emergent business.

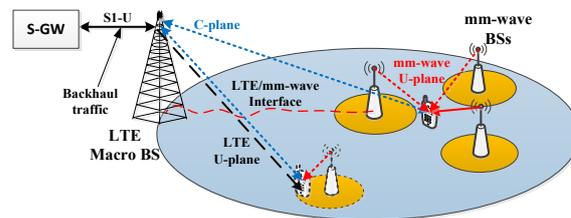


Fig. 4 mm-wave heterogeneous network

### 4. My Life in Japan

I like travelling, like different cultures and customs, like all kinds of delicious food, like Japanese spa, like skiing, etc. After I came to Japan, I have more opportunities to experience these. My family always go to skiing in winter. We also plan a trip every year by air or driving a car. We went to Hokkaido, Nagano and Yamanashi for skiing, went to Shizuoka, Chiba and Okinawa for sea sight-seeing, and went to Osaka, Hiroshima and Fukuoka for delicious food. On weekend, we always went to parks or museums with friends. I can’t image what kind of life I would have if I didn’t come to Japan. That may be totally different from my current one. But I love my current lifestyle and enjoy a lot with my family.

### 5. The End

Finally, I would like to thank to the editor for giving me this chance to share these information. I would also like to express my sincere thanks to all the people who helped me in my life in Japan. Hope this article can help other foreign students/members considering studying or working in Japan to know more about Japan. I think you will not be regret if you come here.

### 6. References

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# Report on the Workshop on Internet Architecture and Applications 2017 (IA2017) in Bangkok, Thailand

Daisuke Kotani

Expert Member, Technical Committee of Internet Architecture, IEICE



## 1. Introduction

The Technical Committee on Internet Architecture (TCIA) has been organizing international workshops every year since 2009. The purpose of the workshops is to promote research activities in Internet and its applications within Asian area, and provide a forum for researchers and practitioners from the academic, industrial, public and governmental sectors to share their latest innovations, as well as internationalization of IEICE. This year, TCIA successfully organized the workshop at Bangkok, Thailand, on November 15 and 16, 2017, with dedicated support from King Mongkut's Institute of Technology Ladkrabang (KMITL) and ECTI Association, Bangkok, Thailand. This article briefly reports the workshop activities.

## 2. Workshop Overview

The workshop opened with more than 40 participants including 20 and more students from four countries (Thailand, Taiwan, Korea and Japan). At the beginning of the workshop, TPC Co-Chairs (Katsuyoshi Iida (Chair of TCIA) and Somsak Choomchuay (KMITL)) made the opening speech, then an invited talk was presented to all participants:

“The Internet of Data Enhancing: The Power of Knowledge,” by Rathachai Chawuthai (KMITL)

The workshop continued with six oral presentations in two technical sessions, Network Security and Networking-1. The speakers shared with the participants their latest research activities ranging from attack detection and mitigation, network design and modeling, to a new network concept for energy delivery.

The last session of the first day was the poster session with eight poster speakers. They had active and constructive discussion of their research achievements and future directions with the workshop participants in variety of topics related to Internet architecture and its applications, such as cloud platform for agriculture, animal observations, human activity monitoring, etc.

After the sessions on the first day, the participants were invited to join in the banquet held near KMITL and Suvarnabhumi Airport. They enjoyed Thailand cuisines and a great night view of a pond and planes as well as expanding their social networks.

The second day of the workshop was started with the other invited talk about 5G:

“A Network Slicing for 5G Networks,”  
by Choong Seon Hong (Kyung Hee University)

He introduced the concept of 5G networks and discussed application of artificial intelligence to 5G networks.

After the invited talk, nine oral presentations were held in three technical sessions, SDN, Applications, and Networking-2. The speakers presented their latest achievements, which covered a broad range of interesting topics on the Internet architecture and its applications, such as SDN applications, network security, network analysis, edge computing, etc. and discussed their ideas and further directions with the participants.

The workshop was closed with the ceremony of Student Presentation Awards and a closing remark by TPC Co-Chairs.

On the next day, some of the participants also joined in the 21<sup>st</sup> International Compute Science and Engineering Conference 2017 (ICSEC 2017), jointly organized by KMITL and ECTI Association.

## 3. Conclusion

We believe that all participants were satisfied with the technical presentations, active discussions, and social events through the workshop. TCIA would like to express our sincere gratitude to all speakers and attendees for their active participation to the workshop, and to KMITL members, Somsak Choomchuay, Rathachai Chawuthai, and Wiboon Promphanich, for their warm hospitality.

Next workshop is expected to be held in Korea. Please visit <http://www.ieice.org/~ia/eng/> for the latest information.



# Report on Japan-Korea Joint Conference on Satellite Communication (JC-SAT 2017)

Kosuke Yamazaki (KDDI Research, Inc.)  
Takashi Takahashi (NICT)



## 1. Overview

This article reports on the Japan-Korea Joint Conference on Satellite Communication (JC-SAT) that was held at Okinawa Cellular Company, Naha-shi, Okinawa, Japan, on October 26<sup>th</sup> and 27<sup>th</sup> (Fig. 1).



Fig. 1 Conference place, Okinawa Cellular Company, Naha-shi, Okinawa, Japan

This conference was jointly organized by Technical Committee on Satellite Communications of IEICE and Korean Society of Space Technology (KOSST) in Korea and sponsored by IEEE VTS Japan Chapter and SCAT.

JC-SAT intends to provide a forum for researchers in satellite communications and applications field to discuss the current status, technical challenges, standards, fundamental issues and future services. This conference will cover technologies and system implementations of satellite communications and applications as they related to the areas of satellite services including GNSS.

## 2. Report on Technical and Special Sessions

The technical program of JC-SAT2017 consisted of 8 General Sessions and 1 Special Session where 26 papers in General sessions and 1 paper in Special

Session were presented. Total number of registered participants reached 65 including 46 from Japan and 16 from Korea (Fig. 2).



Fig. 2 General session of JC-SAT2017, 65 participants actively discussed

The presented papers covered a wide range of unique and novel technical topics on Satellite communication. On the first day of the workshop, 4 general sessions and 1 special session were held. Opening remark was conducted by Dr. Toshinori Suzuki, a chairman of organizing committee of JC-SAT2017 (Fig. 3).



Fig. 3 Opening remarks presented by Dr. Toshinori Suzuki, a chairman of organizing committee of JC-SAT2017

The special talk, “Real challenge for 5G mobile communication systems” was presented by Dr. Fumio Watanabe and critical issues between 5G and satellite communications was introduced (Fig. 4).



Fig. 4 Special talk presented by Dr. Fumio Watanabe

On the second day, 4 general sessions were held. Closing remark was conducted by Dr. Sungtek Kahng and future vision of JC-SAT2018 was presented (Fig. 5).



Fig. 5 Closing remark conducted by Dr. Sungtek Kahng, co-chairman of JC-SAT2017 Technical Committee

### 3. JC-SAT Award Ceremony

The JC-SAT 2017 presented the Best Paper Award (JC-SAT Award) to the authors of the selected outstanding papers at the reception to be held at the first day.

Both KOSST and IEICE select one award-candidate paper from the papers submitted to, reviewed by each organization, disclose the papers each other, discuss the review results of award candidate papers and mutually agree to the selection, which is a mandatory condition for award authorization.

On the first day of JC-SAT 2017, the award was announced and presented to the paper authors (Fig. 6, Fig. 7, Fig. 8).



Fig. 6 JC-SAT Award Ceremony

Through the above procedure, the following two papers were honored as JC-SAT Award and award certificates and extra prize had been handed from Dr. Toshinori Suzuki during JC-SAT Award ceremony on the first day.

1. Masaaki Kojima, Yoichi Suzuki, Yuki Koizumi, Hisashi Sujikai and Shoji Tanaka, “Estimation Technique for Non-linear Characteristics for Satellite Transponder”



Fig. 7 JC-SAT Award awarded to “Estimation Technique for Non-linear Characteristics for Satellite Transponder”

2. Changhyeong Lee, Dajung Han, Heejun Park, Abdul Rehman, Muhammad Salman Khattak and Sungtek Kahng, “Metamaterial Filter and Duplexer for X-band and Ku-band Satellite Communication”



Fig. 8 JC-SAT Award awarded to “Metamaterial Filter and Duplexer for X-band and Ku-band Satellite Communication”

#### 4. Conclusions

As reported, JC-SAT2017 was finished with a great success (Fig. 9). In the steering committee meeting held in the afternoon on the second day, it was decided that the next JC-SAT will be held in Korea on the mid of 2018.

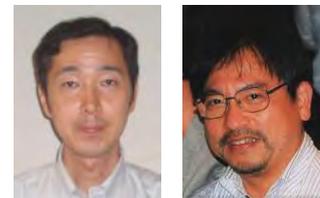


Fig. 9 All participants on JC-SAT2017 Okinawa Japan

# Report on the 13<sup>th</sup> International Conference on Space, Aeronautical and Navigational Electronics 2017 (ICSANE 2017)

Sounosuke Fukushima<sup>1</sup>, Toshifumi Moriyama<sup>2</sup>,  
Akitsugu Nadai<sup>3</sup>

- 1: Electronic Navigation Research Institute (ENRI)
- 2: Nagasaki University
- 3: National Institute of Information and Communications Technology (NICT)



## 1. Introduction

The 13<sup>th</sup> International Conference on Space, Aeronautical and Navigational Electronics (ICSANE 2017) was held at Universiti Malaysia Sarawak (UNIMAS), Sarawak, Malaysia on November 23<sup>th</sup> -24<sup>th</sup>, 2017. This conference was organized by the Technical Group on Space, Aeronautical and Navigational Electronics (SANE) of the Institute of Electronics, Information and Communication Engineers (IEICE) and UNIMAS, and was supported by IEEE AESS Japan Chapter, IEEE GRSS Japan Chapter, Japan Aerospace Exploration Agency (JAXA), Electronic Navigation Research Institute (ENRI). In this report, we describe the purpose and summary of ICSANE 2017.

## 2. Purpose of Conference

The first ICSANE (former name is workshop on Space, Aeronautical and Navigational Electronics (WSANE)) was held in Daejeon, Korea, 2005. After that, ICSANE takes place every year in Asia-Pacific region. ICSANE aims at providing an opportunity for system engineers and researchers to discuss new and viable technical topics of electronics system in spacecraft, aircraft, ships and ground facilities. The detail covered topics are the following:

- (1) Satellite and space-station systems
- (2) Remote sensing and scientific observation technology
- (3) Radar systems and applications
- (4) Navigational and communication systems

## 3. Organizing Committee

The Steering Committee of ICSANE 2017 was strongly led by Co-Chairs and supported by Co-Chairs of Organizing Committee. The other organization is technical program committee. These main committee members are listed as the followings.

- Honorary Chair:  
Mohamad Kadim Suaidi (Vice Chancellor, UNIMAS, Malaysia)
- Steering Committee, Co-Chairs:  
Sounosuke Fukushima (ENRI, Japan)  
Al-Khalid Othman (UNIMAS, Malaysia)
- Organizing Committee, Co-Chairs:

Toshifumi Moriyama (Nagasaki Univ., Japan)  
Kismet Anak Hong Ping (UNIMAS, Malaysia)

- Technical Program Committee, Chair:  
Hirokazu Kobayashi (Osaka Institute of Technology, Japan)

## 4. Program and Activities

At the opening ceremony of ICSANE 2017, Deputy Dean Dr. Nazeri Abdul Rahman of Faculty of Engineering, UNIMAS delivered his warmly welcome address and the introduction of UNIMAS. Next, Dr. Sounosuke Fukushima, who is a chair of SANE, IEICE, expressed his thanks and talked about SANE and ICSANE history. Dr. Toshifumi Moriyama presented the introduction of ICSANE 2017. A group photo of ICSANE 2017 is shown in Fig. 1.



Fig. 1 ICSANE 2017 Group photo of ICSANE

ICSANE 2017 had two keynote talks. First is “Sharing Sarawak experience in the adoption of hyperspectral sensing as an operational tool for sustainable forest management practices (past and the way forward)” presented by Dr. Affendi Suhaili, Systems Application and Development Unit, Forest Department Sarawak, and second is “Recent advances of radar polarimetry and its applications” presented by Prof. Jian Yang, Tsinghua University, China. In addition, we had one special talk entitled “SAR Image Segmentation Based Framework to Ship Detection” presented by Dr. Chihyuan Chu, NTUT, Taiwan and



Fig. 2 Keynote speaker: Prof. Jian Yang



Fig. 3 Special talk speaker: Dr. Chihyuan Chu

one invited talk entitled “Suppressing the topography and grain size effects in multispectral and hyperspectral data processing” presented by Prof. Yasushi Yamaguchi, Nagoya University, Japan, who is a chair of IEEE GRSS Japan Chapter. Figures 2 and 3 are keynote speaker and special talk speaker.

The technical program of ICSANE 2017 consisted of 5 oral sessions. The 21 papers in regular sessions were presented. The papers covered the variety technologies which were satellite, aircraft navigation, radar signal processing, synthetic aperture radar (SAR), remote sensing, etc. Total number of participants reached around 60 in the two days from five countries: Japan, Taiwan, Malaysia, China and Nigeria. In the second day afternoon, a cultural tour to Sarawak Cultural Village was conducted. Figure 4 is the photo of the cultural tour participants.



Fig. 4 Participants of the cultural tour

## 5. Award Ceremony

In the night of first day, an award banquet was held at UNIMAS. We celebrated the winners of young scientist award. ICSANE 2017 TPC Chair, Prof.

Hirokazu Kobayashi presented a testimonial to each award recipient. The winners are as follows:

### Winners of Young Scientist Award:

- Dr. Junjun Yin (Univ. Science and Technology Beijing, China): Polarimetric Parameter for Detection of Double-Bounce Scattering Dominated Areas
- Ms. Eungyeong Ryu (Korea Institute of Ocean Science & Technology, Korea): Comparison of Ship Detection Accuracy Based on Image Contrast with Different Combinations HH- and VV-polarization TerraSAR-X SAR Images
- Mr. Taro Matsuo (University of Electro-Communications, Japan): A Neural Network Augmented Parametric Estimation Method for Accurate Wind Vector Reconstruction Using Single Doppler LIDAR

In addition, the SANE committee offered the letters of appreciation to Prof. Ir. Dr. Al-Khalid Othman and Dr. Kismet Anak Hong Ping for outstanding contributions to ICSANE 2017. Figures 5 and 6 show the scenes of the ceremony.



Fig. 5 Young scientist award-winners: from right, Prof. H. Kobayashi (presenter), Dr. J. Yin, Mr. T. Matsuo, Ms. E. Ryu and Dr. Moriyama



Fig. 6 Dr. S. Fukushima provided the letter of appreciation to Dr. Kismet Anak Hong Ping.

## 6. Conclusions

ICSANE 2017 was successfully held in Malaysia. We hope that all the participants in this conference enjoyed the presentation and discussions on the future trends and the latest advances of research and development on Space, Aeronautical and Navigational Electronics.

## 7. Acknowledge

Prof. Ir. Dr. Al-Khalid Othman and Dr. Kismet Anak Hong Ping and the students of UNIMAS are highly appreciated for their efforts and passion to arrange ICSANE 2017.

# Report on the 2017 NS English Session Awards and Award Ceremony

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## 1. Introduction

In the 2017 IEICE General Conference that was held on 22-25 March 2017, the IEICE Technical Committee on Network Systems (NS) provided the complete English Symposium Session entitled “Advanced Technologies in Communication, Networking, and its Innovative Application for Future Information Network Society”. In this session, 43 papers were presented at a single track during whole of 4-days conference period [1], and the total number of participants was 147.

The NS committee selected recipients of NS English Session Awards among the 43 papers. The recipients won the awards at an award ceremony and presented the progress of their awarded paper as an invited lecture at the NS technical meeting in October 2017.

## 2. Award Ceremony

The award ceremony was held in the NS technical meeting at Osaka city, Osaka Prefecture on 26 October 2017, and 33 participants attended the ceremony. Three distinguished papers won the NS English session awards, and all the recipients received an award certificate and a plaque from NS technical committee chair (Fig. 1).

(For the past recipients, please see our English home page. URL: <http://www.ieice.org/cs/ns/eng/index.html>)

## 3. English Session Awards 2017

The abstracts of the three papers that won the 2017 NS English session awards are as follows.

“Spectrally Efficient Photonic Networks Utilizing Distance and Hop Count Adaptive Subcarrier-Multiplexed Signals” [2]

In coping with the rapid Internet traffic growth, spectral efficiency of photonic networks should be increased. To achieve this, higher-order modulation formats and ultra-dense wavelength-division multiplexing (WDM) need to be employed. However, they incur transmission impairment, and lessen the available transmission distance.

One approach to maximizing the spectral efficiency under such conditions is to use distance-adaptive modulation, where an appropriate modulation format is adopted according to the actual transmission distance. However, the assessment of this method did not adequately examine the impact of a filter-narrowing

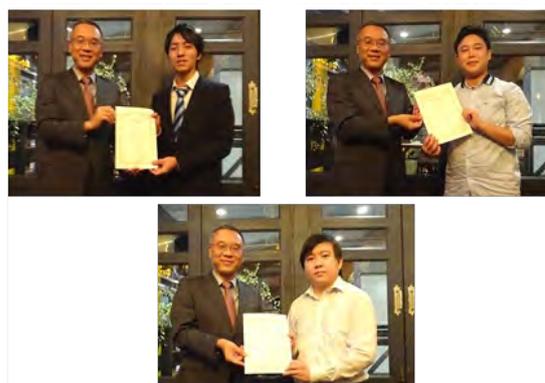


Fig. 1 English session award recipients (Mr. Isono: Top left [2], Mr. Matsui: Top right [3], and Mr. Feng: Bottom [4]), with chair (Dr. Tode).

effect induced by wavelength-selective switches (WSSs) at each photonic node. This is a key deficiency given the severe filtering impairment likely in ultra-dense WDM systems. The adaptive assignment of modulation formats must, therefore, take the filtering impairment into consideration.

The recently proposed subcarrier-multiplexed (SCM) hybrid QAM can alleviate the impact of the filter-narrowing effect. It divides the channel spectrum into multiple subcarriers and each subcarrier is modulated to yield the appropriate M-QAM signal. If we can optimize subcarrier modulation formats considering the filter-narrowing effect, this scheme will be effective in future ultra-dense WDM networks.

We propose a novel modulation format assignment method adaptive to distance and hop count, for improving spectral efficiency with both higher-order modulation and ultra-dense WDM. In addition, we introduce SCM hybrid-QAM signals as modulation candidates for further improvement performance. First, we comprehensively investigate the transmission characteristics of SCM hybrid-QAM signals consisting of 4/8/16/32/64-QAM for various transmission distances and hop counts. Second, we analyze the number of paths for each pair of distance and hop count in real network topologies. Third, based on the above two results, an optimum SCM hybrid-QAM signal is created for each optical path. With such distance/hop-adaptive SCM hybrid-QAM signals, the average

spectral efficiency per path is improved by up to +142% compared with current non-adaptive single-modulation networks.

**“Deriving the Average Message Delivery Delay in Geographic DTN Routing under Random Walk Mobility Model” [3]**

Delay/disruption-tolerant networking (DTN), which allows end-to-end node communication even when communication links between nodes are not functioning normally, has recently been regarded as a promising communication technology for realizing communication infrastructure at the time of disaster and low-cost communication infrastructure.

Most of existing DTN routing algorithms are designed for message delivery between mobile nodes (i.e., message transmission from a mobile node to one or more other mobile nodes). However, in practical applications of DTNs in several fields, endpoints of communication might not be always mobile nodes. In other words, endpoints might also be fixed nodes. This paper investigates a class of DTN routing utilizing mobile nodes for store-carry-and-forward communication among fixed nodes called geographic DTN routing.

A geographic DTN routing aims at realization of message delivery among multiple (generally, geographically-dispersed) geographic locations on a field without necessity of specific communication infrastructure by utilizing mobility of mobile agents.

This paper derives the average and the distribution of message delivery delays of geographic DTN routing with FIFO (First-In First-Out) algorithm under two workload models by modeling the behaviors of mobile agents as multiple random walks on a graph. In this paper, a continuous workload model (i.e., Poisson message arrival) is considered. This paper reveals the effect of system parameters --- the number of mobile agents on the field, the number of message loadings at a geographic location, the message generation rate and the number of message replicas --- on the average and the distribution of message delivery delays.

**“HVC: A Hybrid Cloud Computing Framework in Vehicular Environment” [4]**

With the emergence of self-driving cars, multimedia systems and smart vehicles, more and more applications are coming into vehicular environment. Some of those applications, e.g. augmented reality/image or speech recognition, require high computational capability to achieve real time response. Therefore how to provide the demanded computational resource becomes a crucial problem, especially for vehicles whose hardware is hard to upgrade.

Cloud computing methodology has been popular in recent years. By offloading workloads to servers, it can provide flexible computing services with little setup and upkeep cost. But in vehicular environment, network connection has lower bandwidth and more instability. Also considering the cellular data cost, applying existing cloud computing methods directly in vehicular environment is difficult. However, we also

notice that abundant resources are available on each vehicle from time to time. Utilizing those resources may provide a solution to aforementioned problem.

This paper proposes the hybrid vehicular cloud (HVC) framework for cloud computing on the road to increase the computational capability of vehicles by using resources from the centralized cloud, RSU, and neighboring vehicles. The proposed scheme can be used as a general framework for all types of applications. It is able to satisfy various types of job requirements, such as real time processing or host requirements. The framework is adaptive to the dynamic vehicular environment by using methods to estimate link duration. Specifically, this paper defines the procedures to support the autonomous organization of a vehicular cloud. An online scheduling algorithm is proposed to solve the job assignment problem with the objective of processing more jobs and reducing cellular network usage. Extensive simulations are conducted with realistic traffic and map, and the results show the superiority of the proposed scheme over competing schemes in typical urban scenarios.

**4. Future Plans**

In the 2018 IEICE General Conference at Tokyo Denki University, the English Session entitled “Innovative Information Communication Technologies for Future Network System Supporting Information-oriented Industry” will be held on 20-23 March. Many interesting studies on “network” and “service” including “wireless” and “optical” will be presented. Please attend the IEICE General Conference and enjoy the NS English session during four days.

**5. Acknowledgements**

We would like to give special thanks to Prof. Yoshiaki Tanaka due to his great contributions.

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# Report of SmartCom 2017 — The Fourth International Workshop Held in Rome, Italy —

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Organizing Committee of SmartCom 2017



## 1. Introduction

SmartCom 2017 [1] was held in Roma, Italy on Oct. 23-24, 2017. The number of participants was 52 on the first day and 50 on the second day. The workshop was organized by IEICE Technical Committee on Smart Radio (TCSR) [2] and TC on Short Range Wireless Communications (TCSRW) [3], supported by TC on Radio Communication Systems (TCRCS) [4].

SmartCom 2016 [5] intended to build tight collaborations between European and Japanese researchers for contributions towards future smart communication technologies. SmartCom 2017 is the second series of a joint workshop between Europe and Japan.

The workshop was kicked off with an opening talk of Prof. Umebayashi (Tokyo Univ. of Agriculture and Technology), the chair of TCSR, as shown in Fig. 1. He had a talk about targets of smart wireless communications for the future, what's the smart spectrum and smart spectrum management, the history of SmartCom, and so on.

Prof. Zorzi (Univ. of Padova) and Dr. Fukuda were invited and had each keynote speech. Four special sessions (in total 16 invited talks: EU 9, JP 7) were organized by each TC and EU committee members. Two poster and exhibition sessions were presented by total 31 posters including 3 exhibitions (EU 5, JP 26) as shown in Fig. 2. Each presentation was fairly evaluated by committee members for SmartCom awards. The winners were awarded in the closing session. The workshop was closed by Prof. Kameda (Tohoku Univ.).

We also had exciting lunch with wine, joyful coffee break with espresso and cappuccino (Fig. 3), and banquet in the excellent restaurant (Fig. 4).

Rest of the paper is organized as follows. Section 2 introduces historical background of SmartCom. Sections 3 to 6 reports details and awards of SmartCom 2017. Section 7 gives a plan of SmartCom 2018 to be held in Thailand and Section 8 concludes this paper.

## 2. Historical Background of SmartCom

IEICE needs to increase the international connections and enhance the presence in the world. One of the TCSR's trials for it has been to invite key researchers from the world to TCSR's domestic regular



Fig. 1 Opening talk



Fig. 2 Poster and exhibition sessions



Fig. 3 Coffee break



Fig. 4 Banquet

conferences. This type of activities has been planned annually since year 2005, but limited in Japan only. In the beginning of 2014, TCSR discussed that it is a good trial to have a regular conference outside of Japan. Focusing on Singapore where R&D on wireless communications is very active, TCSR decided to have the first TCSR regular conference outside of Japan, named SmartCom 2014. SmartCom 2014 was held at Institute for Infocomm Research (I2R) in Singapore on October 30-31, 2014. It was co-sponsored by I2R, IEEE VTS SG chapter and IEEE COMSOC Japan chapter. The number of participants at SmartCom 2014 was 78 on the first day and 50 on the second day. It was largely beyond TCSR's expectation at its preparation stage. SmartCom 2014 acquired a number of new participants not only from Asian region, but also from Japan. It was a good surprise that so many students in Singapore participated in SmartCom2014. TCSR recorded the highest number of participants at SmartCom 2014 since TCSR was launched in 2005. SmartCom 2015 was held in Tokyo on October 26 - 27, 2015 organized by IEICE TCSR and TCSRW. SmartCom 2015 was organized by 37 presentations including 1 tutorial, 4 invited talks, 6 posters, 15 technical exhibits and 11 invited lectures. The number of participants was 60 on the first day and 111 on the second day. In the SmartCom 2015, there were tutorial presentation, special session and posters which are related to EU. SmartCom 2016 was held in Oulu, Finland on May 16-17, 2016. The workshop was co-organized by IEICE technical committees and Centre for wireless communications, University of Oulu, Finland. There were two Keynote speeches, 5 special sessions (22 oral presentations), and two poster sessions (35 posters). The numbers of participants in the first day and the second day are 128 and 49, respectively.

### 3. Keynote Speech

Two distinguished keynote speakers were invited from industry and academia of each in the fields of mobile wireless communications, 5G and beyond.



Fig. 5 Keynote speeches  
(Left: Prof. Michele Zorzi,  
Right: Dr. Eisuke Fukuda)

The keynote speech of the first day of the workshop was given by Prof. Michele Zorzi (Fig. 5, left), The University of Padova, Italy. His presentation title is "Spectrum sharing and networking issues in 5G

mmWave cellular networks." Prof. Zorzi explained 5G millimeter wave (mmWave) communications for supporting extremely high data rate. First, spectrum sharing and spectrum pooling in mmWave cellular networks were explained and the performance of spectrum pooling and spectrum sharing in mmWave by using simulation are evaluated. He said that the mmWave networks can achieve better performance thanks to higher isolation and directional transmission. After that the importance of directionality of antenna in an interference scenario was explained. Finally, network layer technologies under mobility were discussed for supporting 5G mmWave with mobility management.

The keynote speech of the second day of the workshop was given by Dr. Eisuke Fukuda (Fig. 5, right), Fujitsu Laboratories Ltd., Japan. His presentation title is "5G, paving a way to transform the world." Dr. Fukuda introduced a future 5G wireless world in which more than 10Gbps data rate, ultra low latency, huge numbers of wireless devices for Internet-of-Things (IoT) devices would be supported. He said these technologies would open up the new era of "Digital Transformation," and drastically change our society life and a way of business into completely different ones with new values. After that a cyber-physical synchronized world among massive objects without restriction in transport of data by using future 5G technologies was explained. Finally, he said that it would be important for future 5G world to be combined with analytics, AI, IoT and robotics.

From these keynote speeches, we could understand a future 5G world not only technologies but also influence to our human life and business.

### 4. Session & Technical Exhibition

Sessions of Poster and technical exhibition were held for two days. Total 28 poster paper and 3 technical exhibition's paper were shown for two days. Since the session of poster and technical exhibition was held after enjoyable lunch time, it has a lively exchange of views about not only technical perspective but also interesting discussion. In this time, the attractive topics of this session are mainly antenna signal processing, base band signal processing, resource control in MAC level, network control. In the first day, there are, network construction for edging, localization and resource control based on localization, D2D communication, Massive MIMO, Radio Environmental Map, error collecting coding for low power blue tooth. In the second day, there are network roaming and multi-operator for 5G networks, wireless communication for V2X and VANET, Experimental evaluation for LPWA, physical layer security and security, MAC protocol, and Channel and rout selection for energy harvesting.

## 5. Special Sessions

### 5.1. Enhanced Wireless Access and Flexible Networking Technologies for beyond 5G IoT

“Special Session: Enhanced Wireless Access and Flexible Networking Technologies for beyond 5G IoT” was organized by Prof. Hirokazu Sawada (NICT, Japan) and Prof. Tadao Nakagawa (Tottori University, Japan). This special session featured the wireless technologies for Internet-of-Things (IoT) in beyond 5G. There were three invited talks. Two talks were from European side and one talk was from Japan side. The first presentation given by Dr. Fumihide Kojima (NICT, Japan) introduced the recent research and development activities of NICT on the wireless-grid systems. The second presentation was given by Prof. Fulvio Babich (University of Trieste, Italy). In the talk, Prof. Babich shared the research work on random multiple access based on Coded Framed Slotted Aloha (CFSA) with interference cancellation. The last talk of this special session, given by Prof. Antonio Capone (Politecnico di Milano, Italy), introduced the network slicing technologies in virtualized mobile network.

### 5.2. Smart Spectrum for Future Wireless Communications

In “Special Session: Smart Spectrum for Future Wireless Communications”, organized by Dr. Kentaro Ishizu (NICT, Japan), we had four invited talks. Two talks are from European side and two are from Japan side. The first talk, software defined network (SDN)-aided Spectrum Sharing for 5G Networks, was presented by Dr. Leonardo Goratti, (FBK CREATE-NET, Italy). The second talk was presented by Prof. Shigenobu Sasaki (Niigata University, Japan). This talk introduced the spectrum management technology which utilizes less reliable information about the spectrum usage. The third talk was given by Prof. Miguel Lopez-Benitez (Liverpool University, U.K). During this talk, Prof. Lopez-Benitez shared the several mechanisms enabling the spectrum coexistence of licensed and unlicensed frequency bands. Future research directions were also provided and discussed. Connected and automated vehicle had been considered for a key technology to realize sustainable future society. The last talk featuring smart spectrum access technology for V2X communications was given by Prof. Takeo Fujii (UEC, Japan).

### 5.3. Millimeter-wave and Edge Computing

In “Special Session: Millimeter-Wave and Edge Computing”, five invited talk was presented. This session was organized by Dr. Antonio De Domenico, (CEA-LETI, France). Three talks were from European side and two talks were from Japan side. The first talk, given by Dr. Valerio Frascolla (Intel, Germany), introduced the use cases and scenarios in which mmWave access technology and multi-access edge technology are combined. Dr. Koji Takinami (Panasonic, Japan) presented the second paper, “5G-MiEdge: Introduction of Millimeter-Wave Edge Cloud

– A Key Technology for 5G Phase II Deployment –”. In the third invited talk, Prof. Alexander Malsev (Intel, Russia) introduced the decision statistics for non-coherent signal detection in multi-element antenna arrays. The fourth talk, provided by Mr. Katsuo Yunoki (KDDI Research, Japan), provided the challenging issues when computation resources are integrated into mobile network. In the last talk of this session, Prof. Stefano Salsano (University of Rome Tor Vergate, Italy) introduced superfluid networking for 5 and its vision and state of the art.

### 5.4. Wireless Access Technologies for 5G and Beyond

“Special Session: Wireless Access Technologies for 5G and Beyond” was organized by Dr. Kazushi Muraoka (NEC Corporation, Japan). This special session aimed to present the key technologies for 5G and Beyond such as massive MIMO, beamforming, new frame design, polar code and so on. This special session was composed of four invited talks among which two talks were from European side and two talks



Fig. 6 Award winners  
(Upper Left: Dr. Antonio De Domenico,  
Upper Right: Mr. Ramez Askar  
Lower: Mr. Shun Ogata)

were from Japan side. In the first talk, Prof. Hidekazu Murata (Kyoto University, Japan) introduced R&D activities for 5G wireless systems in Japan. The talk was based on the IEICE technical report for Technical Group on Radio Communication Systems. The second talk was given by Mr. Tobias Kadur (TU Dresden, Germany). In this talk, Mr. Kadur shared their recent research activity on the gradient-based beam alignment algorithm in order to realize low-cost mmWave devices. The third talk was by Dr. Satoshi Suyama (NTT DOCOMO, Japan). In this talk, Dr. Suyama shared the recent 5G experimental trials of massive MIMO

technologies. In the last talk of this session, Dr. Stefan Parkvall (Ericsson Research, Sweden) provided the research activities of 5G new radio (NR) which is currently under development by 3<sup>rd</sup> generation partnership project (3GPP). This special session provided the attendees the overview and the recent research works about the wireless access technologies for 5G system.

## 6. Awards

The all poster presentations and technical exhibitions were evaluated by three or four researchers from the perspective that (1) Novelty and originality, (2) Technical content and scientific rigor, and (3) Quality of presentation.

- **Best Paper Award:** “Performance Characterization of Urban HetNets with Multi-RAT Small Cells,” Gourab Ghatak, Antonio De Domenico (CEA-LETI), Marceau Coupechoux (Telecom ParisTech)
- **Best Paper Award:** “Analysis of Utilizing Lossless Networks for Self-Interference Cancellation Purpose in Full-Duplex Wireless Transceivers,” Ramez Askar, Abdulsalam Hamdan, Wilhelm Keusgen, Thomas Haustein (Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, HHI)
- **Best Student Paper Award:** “Received-Power-Aware Design of Transmission Probability for Frameless ALOHA,” Shun Ogata, Koji Ishibashi (The University of Electro-Communications)

## 7. SmartCom 2018 in Bangkok, Thailand

The 5<sup>th</sup> SmartCom will be held at Bangkok Thailand in 2018 (October or November). This workshop plans to be organized under the joint leadership of the technical committee on Smart Radio (SR) and Asian Institute Technology, Thailand.

## 8. Conclusion

A lot of participants from academia and industry on wireless communications participated in SmartCom 2017. SmartCom, which is international workshop on Smart Wireless Communications, will be held in many countries and various locations to expand network and extend the scope of the workshop joining IEICE technical committees. The organizing committee hopes that SmartCom is connecting many researchers in the world as well as giving positive feedback to the IEICE operation.

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# Report on the 31<sup>st</sup> Optical Communication Systems Symposium “Growth strategy for optical communications in ICT revolution”

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## 1. Introduction

The 31<sup>st</sup> Optical Communication Systems (OCS) Symposium was held on Dec. 19–20, 2017 at the Toray Human Resources Development Center in Mishima City, Shizuoka, Japan. The symposium was sponsored by the IEICE Technical Committee on OCS, and organized in cooperation with the IEEE Photonics Society Japan Chapter, the Photonic Internet Forum (PIF), and the IEICE Technical Committee on Extremely Advanced Optical Transmission Technologies (EXAT). The number of this year’s participants was 198 and 25 exhibitors participated in the symposium.

## 2. Technical Sessions

The Day 1 (Dec. 19) started with the opening session. First, Dr. Itsuro Morita, the IEICE OCS committee chair, gave a welcome address with an overview of recent activities and future plans of the OCS technical committee. The opening session was then followed by a keynote speech by Prof. Tatsuyuki Negoro (Waseda business school), which was entitled “Competitive strategy in IoT era” (Fig. 1). He discussed IoT business model together with several use cases such as “Kamen rider”, “Yokai watch”, Komatsu and so on. It was pointed out that IoT business essentially consists of following four steps; (1) Monitoring, (2) Control, (3) Optimization, and (4) Autonomy. This keynote speech not only provided better understanding of IoT business but also offered valuable insights into future direction of optical communication field.

The rest of the technical sessions on Day 1 consisted of a poster session and a workshop (Workshop 1). In the poster session, there were 20 posters presented by young researchers and four award winners. The workshop on Day 1 focused on the business strategy in ICT society and its subtitle was “Toward profitable optical communication”. This included the following three invited talks (Fig. 2): patent right and trade secrets by Prof. Katsuya Tamai (University of Tokyo), defeat of Japanese DRAM by Dr. Takashi Yunogami (Microfabrication laboratory), and vertical integration and disaggregation in optical communications by Mr. Yasushi Sugaya (Fujitsu). The workshop served as a valuable opportunity for us to gain insights into successful business of optical communications from the lecturers’ own experiences.



Fig. 1 Keynote speech by Prof. T. Negoro



Fig. 2 Presenters of Workshop 1: from left, Prof. K. Tamai, Dr. T. Yunogami, and Mr. Y. Sugaya

The morning session of Day 2 (Dec. 20) started with IEEE distinguished lecturer talk organized by IEEE Photonics Society Japan Chapter, entitled “Multicore fiber technology for space division multiplexing (SDM)” given by Prof. Kunimasa Saitoh (Hokkaido University) (Fig. 3). He overviewed the recent progress in SDM, especially fiber technology and pointed out that careful consideration on a tradeoff between SDM density and MIMO complexity is required for design of SDM system. Next, three invited lectures were provided with the aim of learning latest technologies in the vicinity of optical communication fields (Fig. 3). The first lecture was “Recent standardization trends in digital coherent optical transceiver” given by Dr. Tetsuyuki Suzaki (NEC). He presented the standardization progress of 100 Gbit/s and beyond optical transceiver mainly in optical internetworking forum (OIF). The second lecturer was Mr. Yoshinori Abe (Pioneer), who gave a talk entitled “Application of optical communication technology to LiDAR.” He provided impressive talk with demonstration of video and numerical simulation, which covered from the principle of Light Detection and Ranging (LiDAR) to its latest progress as a key enabling technology for a realization of autonomous driving. The third invited lecture was given by Dr. Yukihiro Okumura (NTT docomo) entitled “Toward realization of 5G mobile

communication system.” He showed impressive video, demonstrating an example of life and society offered by 5G services, and then overviewed recent technological progress for a realization of 5G systems.

In the afternoon of the Day 2, we organized a special invited talk by Dr. Kazuo Hagimoto (NEL) on “Birth and growth of ultra large capacity optical communication system: following footprints of Dr. Kiyoshi Nakagawa, the second IEICE OCS committee chair,” (Fig. 4) to express our heartfelt condolences for Dr. K. Nakagawa’s death. Dr. K. Hagimoto overviewed the progress of optical communication technology from the birth to the latest trend including his personal memory with Dr. K. Nakagawa, from which we learned about his contribution to progress of optical communication technology and community.



Fig. 3 Invited lecturers: from left, Prof. K. Saitoh, Dr. T. Suzuki, Mr. Y. Abe, Dr. Y. Okumura



Fig. 4 Special invited talk by Dr. K. Hagimoto



Fig. 5 Presenters of Workshop 2: from left, Mr. T. Yoshida, Dr. K. Nakajima, Dr. K. Shimano, and Dr. K. Ikeda

As a final session of this OCS symposium, the workshop featuring the cutting-edge optical communication technologies was held, which consisted of the following four invited talks (Fig. 5): optical communication and information theory by Mr. Tsuyoshi Yoshida (Mitsubishi Electric), perspective to realization of space division multiplexing by Dr. Kazuhide Nakajima (NTT), progress of SDN and software switch by Dr. Katsuhiro Shimano (NTT), large scale optical switch using silicon photonics by Dr. Katsuhiro Ikeda (AIST). The workshop covered exciting challenges ongoing over a wide spectrum of

optical communication and delivered strong promising messages for sustainable growth of this field.

### 3. Rump Session

In the evening of Day 1, we organized a rump session with a topic of “What changes with AI? What can information and communication do?” hosted by Prof. Akihiro Maruta (Osaka University). In order to initiate the discussion, Prof. Hiroshi Hasegawa (Nagoya University) and Dr. Takahito Tanimura (Fujitsu) first gave a short presentation on what artificial intelligence (AI) and machine learning (ML) are and what they provide impacts on optical communication fields. The attendees then had a round-table discussion about not only the benefits in research and development of optical communication but also our life brought by AI/ML and exchanged opinions each other actively.

### 4. Award Ceremony

During the technical sessions, the OCS award ceremony took place on Day 1 (Fig. 6). The OCS Technical Committee presented the following awards to this year’s winners:

- OCS Best Paper Award: “Low loss splice between large effective area ring-core fiber and standard effective area fiber with fluorine-doped cladding,” by Dr. Masato Suzuki, Mr. Yoshiaki Tamura, Mr. Yoshinori Yamamoto, and Mr. Takemi Hasegawa (Sumitomo Electric)
- OCS Young Researchers Award: Dr. Yoshimichi Amma (Fujikura) for “Fusion splice of high-density multicore fiber,” Mr. Shimpei Shimizu (Hokkaido University) for “Separation characteristics of volume holographic spatial mode demultiplexer at 850 nm wavelength,” Dr. Daiki Soma (KDDI Research) for “10-mode-multiplexed transmission over 81 km weakly-coupled few-mode fiber with partial MIMO equalizers.”



Fig. 6 OCS award-winners: from left, Dr. D. Soma, Mr. S. Shimizu, Dr. Y. Amma, Dr. I. Morita (presenter), Dr. M. Suzuki, Mr. Y. Yamamoto, and Mr. T. Hasegawa

### 5. Conclusion

We hope that the symposium offered a meaningful opportunity for the participants to consider future growth strategy in optical communication field. Finally, the OCS technical committee would like to express gratitude to all the speakers, participants, and exhibitors, for making the 31<sup>st</sup> symposium successful.

# Report on IEEE 5G Summit Tokyo

Koichi Asatani  
Nankai University  
General Co-Chair of IEEE 5G Summit Tokyo



## 1. Introduction

This article reports IEEE 5G Summit Tokyo held in Kogakuin University, September 22, 2017. This series of workshop has been organized by IEEE and held in worldwide since 2015. We invited this workshop to Tokyo as the first one in Japan supported by IEEE ComSoc, 5GMF (5<sup>th</sup> Generation Mobile communication promotion Forum), Kogakuin University, NTT DoCoMo, IEICE Communication Society, NEC, Intel, Fujitsu, Huawei USA and National Instrument in addition to IEEE. We are thankful to these sponsors. In this workshop, we welcomed around 200 participants, (Fig. 1). We ended this event on a high note.



Fig. 1 The whole view of workshop venue



Official Logo

## 2. Program at Glance

In this workshop, 5G mobile systems and related technologies were discussed, *e.g.*, Network design, Security, Applications, and Wireless transmission. The program is summarized as follows. Detailed information is provided in the following URL.

<http://www.5gsummit.org/tokyo/>

- Opening and Introduction, *Prof. Koichi Asatani (Nankai Univ.)*
- Opening Remarks, *Mr. Isao Sugino (MIC: Ministry of Internal affairs and Communications)*
- Keynote 1, *Prof. Susumu Yoshida (5GMF)*
- Session 1: 5G Network & Security, *Chair: Prof. Hidenori Nakazato (Waseda Univ.)*, 3 speakers were invited. *Prof. Aki Nakao (Univ. of Tokyo)*, *Dr. Anand Prasad (NEC)*, and *Dr. Zhang Hui*

*(Nankai Univ.)*

- Session 2: 5G Applications including Eco-system, *Chair: Prof. Hidenori Nakazato (Waseda Univ.)*, 3 speakers were invited. *Dr. Kokei Sato (5GMF)*, *Mr. Toru Katagiri (Fujitsu)*, and *Dr. Takashi Shono (Intel)*
- Keynote 2: 5G: Past and Future, *Dr. Seizo Onoe (NTT DoCoMo)*
- Session 3: 5G Radio Access, *Chair: Mr. Takaharu Nakamura (Fujitsu)*, 3 speakers were invited. *Mr. Kazuya Takigawa (National Instruments)*, *Dr. Fumio Watanabe (KDDI)*, and *Dr. Pengfei Xia (Huawei Device)*
- Panel Discussions: Challenges: R&D, Standards, Spectrum & Deployment, *Moderator, Prof. Hiroyuki Otsuka (Kogakuin Univ.)*, 4 panelists were invited. *Prof. Aki Nakao (Univ. of Tokyo)*, *Dr. Pengfei Xia (Huawei Device)*, *Dr. Kohei Sato (5GMF)*, *Mr. Takehiro Nakamura (NTT DoCoMo)*
- Conclusions and Final Remarks, *Prof. Koichi Asatani (Nankai Univ.)*

## 3. Topics

After opening declaration (Fig. 2), Mr. Sugino of MIC talked about introduction of strategic plan in MIC for 5G mobile systems and encouraged R&D of these systems as Opening remarks.



Fig. 2 Opening and Introduction by Prof. Asatani

In Keynote speech #1, Professor Yoshida, Chairman of 5GMF and Honorary Professor of Kyoto University, introduced activities of 5GMF including 5GMF white paper, and promotion of “crossover collaboration” and latest information of “5G trials”, (Fig. 3). In Keynote speech #2, Dr. Onoe of NTT DoCoMo introduced activities for 5G mobile systems in NTT DoCoMo.

Three technical sessions were assigned entitled “Session 1: 5G Network & Security”, “Session 2: 5G Applications including Eco-system” and “Session 3: 5G Radio Access”. Three speakers were invited in each session. In Session 1, chaired by Prof. Nakazato, Waseda University, R&D activities in key network technologies were introduced. In particular, Professor Nakao, University of Tokyo, provided a distinguished talk including introduction of network technologies for 5G mobile systems focusing on slicing and virtualization by software, (Fig. 4).

In Section 2, chaired by Prof. Nakazato, Waseda University, applications using 5G mobile systems were introduced. Dr. Sato introduced summary of applications created by 5GMF. Dr. Shono introduced some solutions in 5G era focusing on Automatic driving systems.

In Section 3, chaired by Mr. Nakamura, Fujitsu, wireless transmission technologies including device technologies were introduced.



Fig. 3 Keynote speech by Prof. Yoshida



Fig. 4 Prof. Nakao's presentation in Session 1

After Keynotes and technical sessions, Panel session, moderated by Prof. Otsuka, Kogakuin University was held. In this panel session, future perspectives of 5G mobile systems were thoroughly discussed.

#### 4. Conclusions

5G mobile systems will be deployed in 2020. It is concluded that 5G Summit Tokyo triggered to promote further R&D and trial activities.

Also this workshop, 5G related activities in Japan showed Japan's presence worldwide. We also had a

good opportunity for discussions and information exchanges with international distinguished speakers.

#### Acknowledgements:

Finally, I would like to give our special thanks to the invited speakers, organizing committee members, sponsors. I also thank Prof. Yokotani for his help in writing this report.



Fig. 5 Speakers and Officers in Organizing Committee

#### Appendix: List of Organizing Committee members

General Co-chair	Prof. Koichi Asatani
General Co-chair	Dr. Seizo Onoe
General Co-chair	Prof. Gong Ke
General Co-chair	Prof. Hiroyuki Otsuka
IEEE 5G Co-Chair	Dr. Ashutosh Dutta
Program Co-Chair	Mr. Roger Jover
Program Co-Chair	Prof. Akihiro Nakao
Treasurer and Web Chair	Dr. Takeshi Takahashi
	Prof. Wu Hong
	Mr. Eiji Kito
	Mr. Yoichi Maeda
	Prof. Hiroyuki Morikawa
	Mr. Takaharu Nakamura
	Mr. Takehiro Nakamura
	Prof. Hidenori Nakazato
	Dr. Kohei Satoh
	Prof. Takatoshi Sugiyama
	Prof. Tetsuya Yokotani
	Ms. Susan Brooks
	Mr. Tamal Chakraborty
	Dr. Chi-Ming Chen
	Dr. Komlan Egoh
	Dr. Rob Fish
IEEE ComSoc	Mr. Adam Greenberg
IEEE ComSoc	Mr. Daphne Lee
IEEE ComSoc	Mr. Bruce Worthman

# Report IEICE Information and Communication Technology Forum 2017

Sławomir Hanczewski  
Poznan University of Technology, Poland



## 1. Introduction

The fifth edition of the IEICE conference Information and Communication Technology Forum was held in Poznań (Poland) on July 4 – 6, 2017. The conference was hosted, for the second time in its history, by the Chair in Telecommunications and Computer Networks of Poznan University of Technology. The first ICTF conference was hosted in Poznań in May 2014. Poznan is the capital of Greater Poland – one of the regions in Poland. It is also a major industrial and scientific center in the country.

The principal organizer of the conference was the European Section of the IEICE (Institute of Electronics, Information and Communication Engineers). The other organizers of the conference, though on a smaller scale, also included the Poznań Division of the Polish Association of Telecommunication Engineers and the Chair in Telecommunications and Computer Networks (Poznań University of Technology). In addition, the ICTF2017 was financially sponsored by the Communications Society of IEICE (IEICE-CS).



Fig. 1 Poznan University of Technology (Lecture-Conference Center)

The 2017 IEICE ICTF aimed at encouraging the collaboration of researchers in academia and industry. The Forum gathered the researchers, professors, PhD students and experts from industry to exchange ideas and discuss major trends and challenges in information and communication technologies. In the course of the conference, participants focused on presenting trends in the Future Communication Technologies and Applications. Furthermore, the aim of the conference was to promote the organizational activities of IEICE in Europe.



Fig. 2 Prof. Krzysztof Wesółowski (Opening remarks)

The opening session of ICTF 2017 was chaired by the Chair of the Organizing Committee, Dr Sławomir Hanczewski. The conference was officially opened by the Dean of the Faculty of Electronics and Telecommunications at Poznan University of Technology, Prof. Krzysztof Wesółowski. Having welcomed the guests, Prof. Wesółowski in his speech briefed the participants on the history and major achievements of the Faculty. He also pointed at the need for cooperation between different research environments. In conclusion, Prof. Wesółowski wished all participant of the conference success and fruitful work. The first session of the ICTF 2017 was augmented by the very interesting presentation of Prof. Toshitaka Tsuda entitled “Core network in 5G Mobile era and ICN”.



Fig. 3 Prof. Toshitaka Tsuda (Core network in 5G Mobile era and ICN)

## 2. Conference Program

Thirty three presentations were given during the conference. Their thematic scope included: Engineering/Fundamentals, Information Processing, Electronics and Communications. The conference was attended (50 persons in total) by representatives of academia (from Japan and Europe) and industrial research centers. The presentations were organized in 13 sessions, which provided the opportunity for the participants to discuss the presentations with the rest of the audience in more detail.



Fig. 4 Dr. Adrian Kliks  
(Spectrum Management and Radio Resource Virtualization – a COHERENT approach)

All of the presentations given during the conference have been submitted for publication in I-Scover. The participants of the conference also had an opportunity to publish their expanded versions in the quarterly Journal of Telecommunications and Information Technology (1/2018). JTIT is a periodical published by The National Institute of Telecommunications in Warsaw ([www.itl.waw.pl/publikacje/kwartalnik-jtit](http://www.itl.waw.pl/publikacje/kwartalnik-jtit)). Access to the articles to be published will be free of charge.

But the ICTF conference is not only about research presentation and discussions on the current issues in IT! The underlying goal of the conference was also to help promote the activity of IEICE in Europe. Therefore, during the conference, the IEICE members attending the conference (from Japan, in particular) provided answers to a variety of questions related to the activity of IEICE and IEICE Europe.

On the second day of the conference the participants enjoyed a guided tour of the Old Town in Poznan. This sightseeing excursion was to provide the participants with practical experience with the history and culture of the city of Poznan. The participants were given extensive information on a number of the city's landmarks, such as the Parish Church in Poznan or the Town Hall. The day was concluded with the palatial celebratory dinner in the restaurant at 95 Rynek during which the participants had a chance to taste the local traditional dishes and get familiar with the regional cuisine.



Fig. 5 Mr. Sanghun Choi (Cost Effective Dummy Generation Scheme in Non-Trusted LBS)

The conference was concluded on July 6<sup>th</sup>. During his closing remarks, Prof. M. Głabowski invited all participants to attend the next year's ICTF conference to be held in Graz (Austria). After the official conclusion of the conference the participants were offered an excursion to the headquarters of Poznan Supercomputing and Networking Center ([www.man.poznan.pl/online/en/](http://www.man.poznan.pl/online/en/)). Here, the participants had a chance to become acquainted with the latest works carried out by this extremely important research center that involve optical-fibre networks, electronics and robotics and multimedia, among others.

## 3. Future Event

The next edition of ICTF conference will be held in Graz (Austria) between 11 - 13 July, 2018. The conference will be hosted by the Institute of Microwave and Photonic Engineering, Technical University of Graz. The web page of the conference is already available at [www.ictf2018.ieice-europe.org](http://www.ictf2018.ieice-europe.org). The web page is regularly updated with current information related to the conference. As usual, all presented papers will be added to I-Scover.

We invite everyone interested to participate in the conference.

# Report on 2017 International Symposium on Antennas and Propagation (ISAP2017)

Toru Takahashi  
Mitsubishi Electric Corporation, ISAP JSC Secretariat



## 1. ISAP2017

2017 International Symposium on Antennas and Propagation (ISAP2017) was held at Graceland Resort & Spa, Phuket, Thailand, from October 30<sup>th</sup> to November 2<sup>nd</sup>, 2017. This was the tenth ISAP outside Japan since the symposium started to be held in Asia-Pacific region every year. ISAP2017 was organized by Electrical Engineering/Electronics, Computer, Communications and Information Technology Association of Thailand (ECTI), and was in cooperation with a lot of academic institutes not only in Asia-Pacific region, but also in USA and Europe. The IEICE Communications Society was also one of the technical co-sponsors for the symposium.

Prof. Monai Krairiksh (King Mongkut's Institute of Technology Ladkrabang) served as General Chair, and Prof. Danai Torrungrueng (Asian Univ.) served as Technical Program Committee (TPC) Chair.

The statistics for paper submission, acceptance, and registration are summarized in Table 1. Papers were submitted from 33 countries/regions not only in Asia-Pacific, but also all over the world. The top three countries for the number of paper submissions were Japan, China, and Thailand. Approximately 200 reviewers including TPC members, who were nominated by international review system, contributed energetically multiple-review work in a limited time and supported TPC. The topics of the symposium were antennas, propagation, electromagnetic theory, and related fields, and the statistics for submitted paper categories are summarized in Fig. 2.

On the first day, October 30<sup>th</sup>, four technical workshops were held. After that, an IEICE session on "how to write a paper" was presented by Prof. Mitoshi Fujimoto, Editor of IEICE Communications Express (ComEX). That was the first trial to introduce IEICE publication activity in ISAP.

On the second day, October 31<sup>st</sup>, the opening ceremony (Fig. 1) and plenary session were held. In the plenary session, the following speeches were presented;

- Prof. John L. Volakis (The Ohio State University, USA), "Ultra-Wideband Arrays with Low Cost Beamforming Back-Ends"
- Dr. Fumio Watanabe (KDDI Research, Inc., Japan), "Real Challenge of Mobile Networks toward 5G: An Expectation for Antennas & Propagation" (Fig. 2)

Table 1 Major statistics

Submitted Papers	452
Accepted Papers	411
Registered Papers	366 (80.97%)

Table 2 Category of Submitted Papers

Antennas	47 %
Propagation	14 %
Electromagnetic Theory	10 %
Related Fields	12 %
Special Sessions	17 %



(a) Greeting from General Chair, Prof. M. Krairiksh



(b) VIP Members

Fig. 1 Opening Ceremony



Fig. 2 Plenary Talk by Dr. Fumio Watanabe

- Prof. Stefano Maci, (University of Siena, Italy),  
“Guidance and Radiation of Metasurface-Waves”

After the plenary session, 50 technical oral sessions, 3 poster sessions were presented during three days from October 31<sup>st</sup> to November 2<sup>nd</sup>.

Participants were hosted at the comfortable Banquet in the evening on November 1<sup>st</sup>, and enjoyed watching traditional dance of Thailand (Fig. 3).

## 2. ISAP International Steering Committee Meeting

The ISAP International Steering Committee (ISC) Meeting was held at the symposium venue in the evening on October 31<sup>st</sup>.

The ISAP-ISC was established at ISAP2006 by members from 9 countries/regions. The mission of the committee is planning future ISAP and establishing operation rules to steer the symposia smoothly using international cooperation. Now, the committee members are from 12 countries/regions; Australia, China, Hong Kong, India, Japan, Korea, Macau, Malaysia, Singapore, Taiwan, Thailand, and Indonesia.

The operation and venue for future ISAP were discussed in this meeting. After the discussion, it has been decided that the venue of ISAP2020 will be Osaka, Japan. Incidentally, the venues up to 2019 have been decided to be Busan, Korea in 2018, and Xi’an, China in 2019.

Figure 4 shows photo of the ISC Member.

## 3. ISAP Archives

ISAP-ISC also set up ISAP Archives recording all papers presented at the past ISAP. At this time, all the papers from the first ISAP in 1971 to ISAP2016 have been digitized and online. As a result, anybody in the world AP community can access ISAP papers with free of charge. The archive is updated every year. This service will respond to expectations of AP specialists in the world and enhance motivations especially for Asian people to submit papers.

The URL of the ISAP Archives is “<http://ap-s.ei.tuat.ac.jp/isapx/>” and the top page is shown in Fig. 5. The site can also be reached through the web site of the IEICE Knowledge Discovery, I-Scover (<http://i-scovee.ieice.org/>). The papers of the latest ISAP will be archived almost a half year later after the ISAP. The papers of ISAP2017 will appear in the ISAP Archives soon. In addition to the ISAP Archives, the papers of recent ISAPs have also been included in IEEE Xplore.

## 4. Conclusion

ISAP2017 provided to contributors and participants an academic and friendship atmosphere for exchanging advances in AP research and strengthening relationship. Many young students also had a chance to discuss with the experts in their fields. The upcoming ISAP2018 will be held in Busan, Korea, from October 23<sup>th</sup> to 26<sup>th</sup>, 2018. Deadline for paper submission is May 18<sup>th</sup>, 2018. For more details, please visit the ISAP2018 Web site shown in Fig. 6 (<http://isap2018.org/>).



Fig. 3 Traditional dance of Thailand at Banquet



Fig. 4 ISC Member



Fig. 5 ISAP Archives Web site  
(<http://ap-s.ei.tuat.ac.jp/isapx/>)

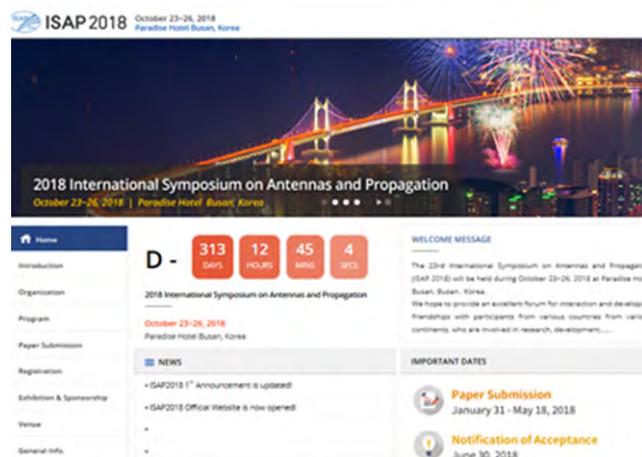


Fig. 6 ISAP2018 Web site (<http://isap2018.org/>)

# Report on the 24<sup>th</sup> General Congress of the International Commission for Optics (ICO-24)

Takuo Tanemura  
The University of Tokyo



## 1. Introduction

The 24<sup>th</sup> General Congress of the International Commission for Optics (ICO-24) was held at Keio Plaza Hotel, Tokyo during August 21-25, 2017 [1]. It was jointly organized by the International Commission for Optics (ICO) and Science Council of Japan (SCJ), co-sponsored by the Japan Society of Applied Physics (JSAP), the Optical Society of Japan (OSJ), and technically co-sponsored by IEICE Communications Society, IEICE Electronics Society, as well as eleven other academic organizations in Japan, Europe, United States, and Asia.

## 2. Overview

The ICO Congress has established itself as one of the most prestigious international conferences in the field of optics and photonics. The first Congress of the ICO was held in Delft, the Netherlands, in July 1948, the year after the ICO was established, with the aim of providing a forum to discuss progress in optics and photonics. Since then, the ICO Congress has been held every three years, and gained participation from all over the world, including developing countries. ICO-24 was the second to be held in Japan, 34 years since ICO-13 was held in Sapporo.

The main theme of ICO-24 was set to “Light for Society.” The aim was to gather the top-level scientists and researchers from all over the world to exchange ideas and discuss how advanced optical and photonic technologies could contribute to improving the quality of life (QoL) as well as solving critical issues of human beings, such as global energy, environment, and medicine.

As a result, we were successful to have 1,006 participants in total from 45 countries, among which around 600 were from Japan and 400 were from abroad. This was close to our target number of 1,100. The participants greatly enjoyed the opening ceremony, technical sessions, welcome reception, banquet, and the closing ceremony.

## 3. Opening Ceremony

It was our great honor that the opening ceremony took place in the presence of Their Majesties the Emperor and Empress of Japan. In the ceremony, following the welcoming address by Prof. Yasuhiko Arakawa (President of ICO, General Chair of ICO-24), we received precious speeches from Prof. Takashi

Onishi (President of the SCJ), Prof. Kennedy Reed (President-designate of the International Union of Pure and Applied Physics), Mr. Masaji Matsuyama (Minister of State for Science and Technology Policy), Ms. Yuriko Koike (Governor of Tokyo), and Prof. Makoto Gonokami (President of the University of Tokyo), as well as warm message from the Prime Minister of Japan, Shinzo Abe. The ceremony ended with a great success, part of which was broadcasted by the major Japanese TV news channels.

## 4. Plenary Sessions

Another highlight of ICO-24 was the prominent Plenary Sessions, which were held twice during the conference. The plenary talks were given by the world-renowned speakers, namely, Prof. Hiroshi Amano (Nagoya University, Nobel laureate in physics 2014), Prof. Takaaki Kajita (University of Tokyo, Nobel laureate in physics 2015), Prof. Anne L’Huillier (Lund University), Prof. Christopher Dainty (University College of London), and Prof. James G. Fujimoto (Massachusetts Institute of Technology). The audiences greatly enjoyed the distinguished lectures on variety of different topics related to optics and photonics.

## 5. Technical Sessions

The technical program of ICO-24 consisted of 683 papers in total (including 18 keynote and 80 invited talks), categorized into 18 different scopes: (1) Optical design, optical materials, and photo lithography, (2) Vision, color, display and lighting, (3) Optical metrology, (4) Optical imaging and optical information processing, (5) Advanced microscopy and spectroscopy, (6) Biomedical optics/photonics, (7) Nonlinear optics, (8) Ultrafast phenomena and ultrafast optics, (9) High power lasers and applications, (10) X-ray and high-energy optics, (11) Microwave/millimeterwave/THz photonics, (12) Near field optics, plasmonics, and metamaterials, (13) Photonic crystal, nano structures and functions, (14) Optoelectronics and photonic devices, (15) Optical MEMS and micro-optics, (16) Quantum optics and atom optics, (17) Fiber optics, (18) Optical communications and photonic network.

The program was carried out in the maximum of 11 parallel sessions, in which respective categories were carefully slotted in series to avoid scheduling conflict among similar topics. In each session, we witnessed active discussions among the participants to exchange updated research results as well as novel ideas.



Fig. 1 Prof. Arakawa (center, the General Chair of ICO-24), Prof. Amano (left, plenary speaker), and Prof. Kajita (right, plenary speaker)

## 6. Student Award and Award Ceremony

The 18 top-scored students were awarded Student Award, which was sponsored by the Optical Society of America (OSA), the International Society for Optics and Photonics (SPIE), and the ICO. The recipients were selected from each category by the ICO-24 technical program committees and awarded during the banquet.

In addition, the recipients of ICO Prize 2014 and ICO Galileo Galilei Award 2015 were awarded at the award ceremony, which was held during the conference.

## 7. Banquet

As a social event, a delightful banquet party was held inside the Keio Plaza Hotel in the evening of the third day. The participants enjoyed delicious Japanese cuisine as well as exceptional dance and music performances.

## 8. Open Lecture to Public Audience

In addition to the regular conference, a tutorial lecture was organized, which was open to general public for free of charge. The lecture was given in Japanese by Prof. Takaaki Kajita on the topic of neutrino, gravity wave, cosmophysics, and their relevance to optics and photonics technologies. After the enlightening lecture by Prof. Kajita, Q&A session was prepared to accept questions from the audiences. More than 300 people, including many high-school and middle-school students, attended the lecture and participated actively in the Q&A session. It ended with a great success in stimulating future young scientists.

## 9. Future Plan

At the General Assembly of the ICO, which was held during the conference, it was decided to hold the next ICO-25 at Dresden, Germany, in year 2020.

We hope to see you all in Dresden!

## Reference

[1] <http://ico24.org/>



Fig. 2 Banquet



Fig. 3 Open lecture to public audience given by Prof. Takaaki Kajita



Fig. 4 ICO committee

# Report on 13<sup>th</sup> International Conference on Network and Service Management (CNSM 2017)

Masaharu Hattori<sup>†</sup>, Yoshiaki Kiriha<sup>‡</sup>, and Yoshiaki Tanaka<sup>††</sup>

<sup>†</sup>Publicity Co-chair of CNSM 2017, KDDI Research, Inc.

<sup>‡</sup>General Co-chair of CNSM 2017, The University of Tokyo

<sup>††</sup>General Co-chair of CNSM 2017, Waseda University



## 1. Introduction

The 13<sup>th</sup> International Conference on Network and Service Management (CNSM) was held from November 26 to 30, 2017 at Waseda University, Tokyo, Japan [1].

The conference is the premier annual conference in the general area of network and service management. It is one of the best chances for presenting and discussing the latest innovations, results, and developments in managing networks, pervasive systems, enterprise and cloud environments. It is attended by foremost experts in this area from academia and industry.

The conference was organized by Waseda University, technically co-sponsored by IEICE ICM Committee, IFIP, IEEE Communications Society, IEEE Computer Society, and in cooperation with ACM.

## 2. Technical Program

The main single-track technical program is complemented by keynote speeches, a Distinguished Experts Panel (DEP) session, poster sessions, and workshops. 136 papers were submitted to CNSM 2017, and 24 papers were accepted to the main track. The acceptance rate is 17%. 160 people from 26 countries participated in this conference (Fig. 1). This conference is the highest class conference in this research area.



Fig. 1 Participants in technical session

Three executives delivered keynote speeches in the main track. Prof. Akihiro Nakao, from the University of Tokyo gave a speech on “Application Centric E2E Slicing Challenges for The Thinking Networks” (Fig. 2). Prof. Rolf Stadler from KTH Royal Institute of Technology, Sweden showed a “Data-driven Network Engineering and Management.” Dr. Glenn Ricart, from US Ignite who is a founder and CTO introduced a “Networking Grand Challenges for 5G/IoT Advanced Applications and Platforms in US Ignite in 5G/IoT era.”

In the DEP session, a moderator, Dr. Katsumi Emura, NEC, and four panelists debated various topics related to the session theme “Big Data Analytics for Networks: status and challenges” (Fig. 3) after the panelists made presentations one by one.



Fig. 2 Keynote speech presented by Prof. Nakao



Fig. 3 DEP session

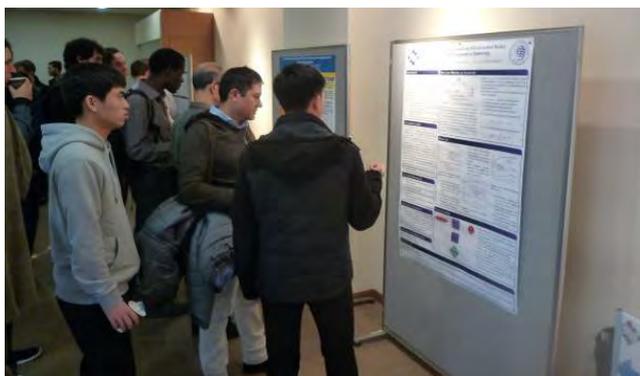


Fig. 4 Poster session



Fig. 5 Workshop

In the poster session, 30 papers were presented. The presenters of these papers and participants conducted lively discussion (Fig. 4).

Regarding to the workshop, there were two workshops which were “International Workshop on Internet Charging and QoS Technologies (ICQT)” (Fig. 5) and “International Workshop on Management of SDN and NFV Systems (ManSDN/NFV)”. The numbers of presented papers in these workshops were 8 and 20, respectively.

### 3. Social Program

On November 28, the welcome reception was held on the 15<sup>th</sup> floor of the building, where people could see a beautiful night view of Shinjuku. On November 29, the social event and the gala dinner were held. The social event was an opera. Famous baritone singer, Yuma Shimizu, and pianist, Shiho Fujikawa, performed 8 opera songs (Fig. 6). After the opera, more than 120 participants of the conference and guests including previously described two musicians joined in the gala dinner held at a hotel in the campus.



Fig. 6 Opera



Fig. 7 Congratulatory address by IEEE Computer Society President-Elect

Another guest was Prof. Hironori Kasahara, Waseda University who is IEEE Computer Society President-Elect. He delivered a congratulatory address (Fig. 7).

### 4. Award

Lastly, the CNSM 2017 technical program committee selected the best paper award and the best student paper award from technical session papers.

The best paper award winner was Shihabur Rahman Chowdhury from University of Waterloo, Canada, who presented “MULE: Multi-Layer Virtual Network Embedding” (Fig. 8 (a)). The best student paper award winner was Davit Harutyunyan from FBK, Italy, who presented “Flexible Functional Split in 5G Networks” (Fig. 8 (b)).



(a) Best paper award



(b) Best student paper award

Fig. 8 Winners of the best paper awards

### 5. Conclusion

On behalf of all OC members of CNSM 2017, we would like to express our appreciation to all parties involved in this conference. The next CNSM will be held in Rome, Italy, in November 2018.

### References

- [1] Home page of CNSM 2017,  
<http://www.cnsm-conf.org/2017/index.html>

# Report on the 8<sup>th</sup> International Conference on ICT Convergence (ICTC 2017)

Oh-Soon Shin<sup>1</sup>, Sang-Jo Yoo<sup>2</sup>, and Sunghyun Choi<sup>3</sup>

<sup>1</sup>Soongsil University, Korea, <sup>2</sup>Inha University, Korea

<sup>3</sup>Seoul National University, Korea



## 1. Introduction

The 8<sup>th</sup> International Conference on Information and Communication Technology Convergence (ICTC 2017) was held in Lotte City Hotel, Jeju Island, Korea from October 18<sup>th</sup> to 20<sup>th</sup>, 2017 [1]. ICTC is a leading, flagship international conference hosted by the Ministry of Science, ICT and Future Planning (MSIP) of Korea government, organized by the Korean Institute of Communications and Information Sciences (KICS) and technically co-sponsored by IEICE-CS and IEEE Communications Society. ICTC 2017 features an extremely rich program with the main theme of “ICT Convergence Technologies Leading the Fourth Industrial Revolution.” The conference addresses numerous challenges of ICT convergence over various industrial sectors, including wireless and mobile communication systems and infrastructure, future networks, services and applications, smart devices and consumer appliances, cloud computing, green communication, healthcare and bio-informatics, and Internet of Things (IoT).

## 2. Conference Program

The conference program includes plenary sessions, invited industrial sessions, technical paper sessions, and special sessions.

In two plenary sessions (Fig. 1), we had 5 keynote speeches. The Plenary Session 1 was started with the opening address by Prof. Youze Cho (President of KICS), and a congratulatory address by Prof. Kohei Shiimoto (Representative of IEICE-CS). Then, Dr. Alberto Leon-Garcia (Professor of University of Toronto, Canada) delivered a keynote speech on “Integrating IoT into Multi-tier Cloud Computing,” which was followed by another keynote speech on “Intelligent GiGA Infra as the 4<sup>th</sup> Industrial Revolution Enabler” by Dr. Hongbeom Jeon (Executive Vice President of KT, Korea). Plenary Session II consists of 3 keynote speeches. Dr. Max Muhlhauser (Professor of TU Darmstadt, Germany) delivered a keynote speech on “IoT as a Driver for the Next Wave of ICT Convergence,” and Dr. Geza Kolumban (Professor of Pazmany Peter Catholic University, Hungary) delivered a keynote speech on “Limits and Applicability of UWB Impulse Radio Technology in Cyber-Physical Systems,



Fig. 1 Plenary Session

and Biomedical Applications.” Dr. Durga Malladi (Senior Vice President of Qualcomm, USA) delivered the last keynote speech on “Fueling the Next Technical Revolution with 5G.”

Each of two industrial sessions (Fig. 2) consists of 2 invited talks from industries. The theme of Industrial Session I was IoT, cloud computing, and automated driving. Dr. Minkyong Kim (Vice President of Samsung Electronics, Korea) and Mr. JaeKyun Chang (Head of Interior S&T Korea, Continental Automotive Korea) gave excellent talks on the theme. In Industrial Session II, Mr. Takehiro Nakamura (Vice President & General Manager of 5G Laboratory, NTT DOCOMO, Inc., Japan) and Dr. Anand Prasad (Chief Advanced Technologist, NEC Corporation, Japan) gave interesting talks on 5G and IoT security.

Regarding technical paper sessions (Fig. 3), 533 papers were submitted to the conference from 36 countries. After thorough review process, the technical program committee (TPC) accepted 256 papers and collected 64 invited papers, which were organized into



Fig. 2 Industrial Session



Fig. 3 Technical Session

30 oral sessions and 2 poster sessions. The overall acceptance ratio was about 48%. The topics of technical paper sessions covered wireless and mobile communications, information and communication theory, future internet, smart media and broadcasting, green communication technologies, smart grid, u-healthcare and bio-infomatics, IoT, Machine-to-Machine (M2M), and encryption and security. In addition, 6 special sessions were organized with 18 invited talks from academia and industries.

### 3. Social Events

At the first night, the welcome reception was held at Foyer Room of hotel. The participants enjoyed the beverage and cookies talking together.

The conference banquet (Fig. 4) was held at the second night. The banquet began with a welcome address and introduction of OC members by Dr. Seung Ku Hwang (Organizing Committee Chair). Prof. Sangjo Yoo (TPC Chair) made a TPC report, including paper statistics and Best/Excellent Paper Award selection procedure. Then, a Symposia Program Committee (SPC) report was made by Prof. Sunghyun Choi (SPC Chair). 2 Best Paper Awards and 3 Excellent Paper Awards were presented to the authors of five selected papers (Fig. 5). In recognition to outstanding research achievement and contribution to KICS, KICS Dr. Irwin Jacobs Awards were presented to Dr. Yeong Min Jang (Professor of Kookmin University, Korea) and Dr. Yoan Shin (Professor of Soongsil University, Korea). Finally, ICT Express Best Paper Award was given to Dr. Geza Kolumban (Professor of Pazmany Peter Catholic University,



Fig. 4 Conference Banquet



Fig. 5 Best/Excellent Paper Award

Hungary). All participants enjoyed the banquet with nice Korean food and an exciting performance.

### 4. Conclusion

Since 2010, ICTC has been the unique global premier event for researchers, industry professionals, and academics interested in the latest developments in the emerging industrial convergence centered on the ICT technologies. On behalf of OC and TPC, we would like to thank all the participants and sponsors who made ICTC 2017 a big success. It is our great pleasure to announce that the next event, ICTC 2018, will be held in Maison Glad Jeju, Jeju Island, Korea, during October 17<sup>th</sup>-19<sup>th</sup>, 2018 [2]. ICTC 2018 invites the submission of original research works in all areas of infrastructure, services, technologies, and application of ICT convergence.

### References

- [1] <http://ictc2017.org/>
- [2] <http://ictc2018.org/>

# Report on the 6<sup>th</sup> IEEE International Conference on Renewable Energy Research and Applications (ICRERA2017)

Nobumasa Matsui  
Nagasaki Institute of Applied Science



## 1. Introduction

The 6<sup>th</sup> IEEE International Conference on Renewable Energy Research and Applications (ICRERA2017) was held on 5-8 November 2017 at San Diego, CA, USA. San Diego is, on the coast of the Pacific Ocean in Southern California, about 190 km south of Los Angeles and immediately adjacent to the border with Mexico. Also, in San Diego City, trolleys for realizing the low carbon society are slowly moving through the downtown. ICRERA is the annual world-class technical forum presenting the latest research topics in the renewable energy technologies and their applications.

The main sponsors of ICRERA2017 are the International Journal of Renewable Energy (IJRER) and IEEE Power Electronics Society (PELS). PELS has joined as one of the main sponsors of ICRERA since 2016. IEEE Industry Applications Society (IAS), IEEE Industrial Electronics Society (IES), the Institute of Electrical Engineers of Japan (IEEJ) and the Institute of Electronics, Information and Communication Engineers (IEICE) support the conference as a technical co-sponsor. It is also supported by San Diego State University, USA, Nagasaki University, Japan, Gazi University and Nisantasi University, Turkey.

## 2. Conference Overview and Tutorials

The conference program consisted of 3 keynote addresses, 30 technical sessions, 9 special sessions and 4 tutorials. On Sunday, the first day of the conference, 4 tutorials were offered about integrating renewable energy sources in smart grid system, lazy and partition clustering method for wind energy and energy management of green telecom, further, renewable and regenerative energy application for electric railway, respectively.

## 3. Opening Ceremony and Keynote Speeches

On Monday morning, the second day of the conference, the opening ceremony was held by General Chair, Prof. Yusuf Ozturk, General co-chairs, Prof. Ilhami Colak and Prof. Fujio Kurokawa. After the opening ceremony, three high-profile keynote speakers, Prof. Chris Mi, Prof. Yen-Shin Lai and Prof. Mehdi Ferdowsi gave keynote speeches about the latest high efficiency wireless charging of electric vehicles, the roles of power electronics after COP21 and the dc distribution systems, respectively. They have presented about technologies, social implementation and the cost of each subjects.

## 4. Technical Program

There were total 374 submissions are given a renewable energy research and their applications from 41 countries. 210 papers (144 oral presentations and 66 poster presentations) were accepted for presentation by careful peer review process. The technical program was scheduled through Monday afternoon and Wednesday evening. Each session was kept the schedule, and attendances discussed about the interesting subjects, advances and developments in renewable energy research and their applications.

## 5. Conclusions

ICRERA has been the forum for researchers and engineers in renewable energy since 2012. In 2016, IEEE PELS joined main sponsors of this conference. 374 papers were submitted and 210 papers presented on ICRERA2017 from more than 41 countries and regions. ICRERA2017 successfully provided an excellent venue and facilitated the research collaboration in renewable energy technologies.

IEEE ICRERA2018 will be held in Paris, France on 14-17 October 2018.



Fig. 1 Opening Ceremony



Fig. 2 Trolley in San Diego

### IEICE-CS Related Conferences Calendar

Date	Conference Name	Location	Note
28 Jul. – 2 Aug. 2019	IEEE International Geoscience and Remote Sensing Symposium 2019 ( <b>IGARSS 2019</b> )	Yokohama, Japan	TBD
7 Jul. – 11 Jul. 2019	The 24 <sup>th</sup> Opto-Electronics and Communications Conference / International Conference on Photonics in Switching and Computing 2019 ( <b>OECC / PSC2019</b> )	Fukuoka, Japan	TBD
3 Jun. – 6 Jun. 2019	2019 Joint International Symposium on Electromagnetic Compatibility and Asia-Pacific International Symposium on Electromagnetic Compatibility, Sapporo ( <b>EMC Sapporo &amp; APEMC 2019</b> )	Sapporo, Japan	TBD
6 Nov. – 9 Nov. 2018	2018 Asia-Pacific Microwave Conference ( <b>APMC 2018</b> )	Kyoto, Japan	Submission due: 19 May 2018 <b>See page 45</b>
29 Aug. – 31 Aug. 2018	2018 IEEE International Workshop on Electromagnetics: Applications and Student Innovation Competition ( <b>iWEM 2018</b> )	Nagoya, Japan	Submission due: 10 May 2018 <b>See page 44</b>
4 Jul. – 7 Jul. 2018	The Tenth International Conference on Ubiquitous and Future Networks ( <b>ICUFN 2018</b> )	Prague, Czech Republic	Submission deadline: Closed
2 Jul. – 6 Jul. 2018	The 23 <sup>rd</sup> Opto-Electronics and Communications Conference ( <b>OECC 2018</b> )	Jeju Island, Korea	Submission due: 23 March 2018
3 Jun. 2018	Technology Trials and Proof-of-Concept Activities for 5G and Beyond 2018 ( <b>TPoC5G 2018</b> )	Porto, Portugal	Submission deadline: Closed
20 May 2018	The 11 <sup>th</sup> International Workshop on Evolutional Technologies & Ecosystems for 5G Phase II ( <b>WDN-5G ICC2018</b> )	Kansas City, USA	To be held <b>soon</b>
18 Dec. – 20 Dec. 2017	Japan-Africa Conference on Electronics, Communications and Computers 2017 ( <b>JAC-ECC 2017</b> )	Alexandria, Egypt	Done
11 Dec. – 13 Dec. 2017	The 23 <sup>rd</sup> Asia-Pacific Conference on Communications ( <b>APCC 2017</b> )	Perth, Australia	Done
4 Dec. – 6 Dec. 2017	2017 IEEE International Conference on Antenna Measurements & Applications ( <b>2017 IEEE CAMA</b> )	Tsukuba, Japan	Done
26 Nov. – 30 Nov. 2017	13 <sup>th</sup> Int. Conference on Network and Service Management ( <b>CNSM 2017</b> )	Tokyo, Japan	<b>Reported</b> on this issue
14 Nov. – 16 Nov. 2017	The fifth ENRI International Workshop on ATM/CNS ( <b>EIWAC 2017</b> )	Tokyo, Japan	Done
5 Nov. – 8 Nov. 2017	International Conference on Renewable Energy Research and Applications ( <b>ICRERA 2017</b> )	San Diego, USA	<b>Reported</b> on this issue
30 Oct. – 2 Nov. 2017	2017 International Symposium on Antennas and Propagation ( <b>ISAP 2017</b> )	Phuket, Thailand	<b>Reported</b> on this issue
18 Oct. – 20 Oct. 2017	International Conference on Information and Communication Technology Convergence ( <b>ICTC 2017</b> )	Jeju Island, Korea	<b>Reported</b> on this issue
22 Sep. 2017	IEEE 5G Summit Tokyo ( <b>5G Summit</b> )	Tokyo, Japan	<b>Reported</b> on this issue
21 Aug. – 25 Aug. 2017	The 24 <sup>th</sup> Congress of the International Commission for Optics ( <b>ICO-24</b> )	Tokyo, Japan	<b>Reported</b> on this issue
4 Jul. – 6 Jul. 2017	2017 IEICE information and Communication Technology Forum ( <b>IEICE ICTF2017</b> )	Poznań, Poland	<b>Reported</b> 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
May 2019	European ICT R&D Project Activities on Broadband Access Technologies in Conjunction with Main Topics of 2016/2017 IEICE ICT	Submission due: 7 June 2018 <b>See page 37</b>
Apr. 2019	Sensing, Wireless Networking, Data Collection, Analysis and Processing Technologies for Ambient Intelligence with Internet of Things	Submission due: 11 May 2018 <b>See page 36</b>
Mar. 2019	Network Virtualization and Network Softwarization for Diverse 5G Services	Submission due: 12 April 2018 <b>See page 35</b>
Feb. 2019	Recent Progress in Antennas and Propagation in Conjunction with Main Topics of ISAP2017	To be issued
Jan. 2019	No special section this issue	
Dec. 2018	No special section this issue	
Nov. 2018	No special section this issue	
Oct. 2018	Wireless Distributed Networks for IoT Era	To be issued
Sep. 2017	No special section this issue	
Aug. 2018	Autonomous Decentralized Systems Technologies and Approaches Innovation through Structure Change of Society and Life	To be issued
Jul. 2018	Communication Quality in Wireless Networks	To be issued
Jun. 2018	No special section this issue	
May 2018	No special section this issue	
Apr. 2018	Optical Access System for Social Life	To be issued <b>soon</b>
Mar. 2018	Network Resource Control and Management for IoT Services and Applications	Vol. E101-B, No. 3
Feb. 2018	Recent Progress in Antennas and Propagation in Conjunction with Main Topics of ISAP2016	Vol. E101-B, No. 2
Jan. 2018	Internet Technologies to Accelerate Smart Society	Vol. E101-B, No. 1

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 Network Virtualization and Network Softwarization for Diverse 5G Services -----

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Network Virtualization and Network Softwarization for Diverse 5G Services" in **March 2019**.

ICT (Information and Communication Technologies) have become an indispensable social infrastructure for our everyday life and industry activities by making ICT systems be flexible, scalable, efficient and sustainable. Recently, extensive efforts are being made towards 5G mobile services, including research projects, proof-of-concept demonstrations, field trials, standardization and consortium activities, and so forth. Such industry efforts, with complemented by academic insights, have materialized the necessity of network virtualization and softwarization as key concepts and guiding principles.

Advanced technologies for network virtualization and softwarization are expected to provide flexibility to satisfy a wide variety of customer demands, scalability to expand in accordance with the increase of demands, efficiency in resource usage even under scarce and heterogeneous environment, and sustainability to involve new functionalities and technologies in an incremental manner for service continuity. They imperatively require such techniques to construct virtual networks providing diverse services on a substrate infrastructure consisting of network resources, computational resources and storage resources. In addition, focusing on end-to-end service offering, it is essential to study and develop such techniques to virtualize wireless access networks with their integration to other virtualization techniques.

We thus call for publications (scheduled to appear in the March 2019 issue) for promoting discussion and development of network virtualization and softwarization for diverse 5G services, especially on architectural examination, resource management and control approaches, wireless access virtualization, SDN/NFV applications, and so forth.

## 1. Scope

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

- Network virtualization for diverse 5G services
- Network softwarization and open-source software
- Network management and control in network virtualization
- Wireless access virtualization and its related wireless communication technologies
- Edge computing for 5G services
- Application of Software defined networking and Network function virtualization
- Innovative applications based on network virtualization
- Security for network virtualization and secure services
- Testbeds for above technologies and experimental results

## 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](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](https://review.ieice.org/regist/regist_baseinfo_e.aspx) by **April 12th, 2018 (JST)**. Authors should choose the Network Virtualization and Network Softwarization for Diverse 5G Services as a "Journal/Section" on the online screen. Do not choose [Regular-EB].

### Contact point:

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## Call for Papers

### --- Special Section on Sensing, Wireless Networking, Data Collection, Analysis and Processing Technologies for Ambient Intelligence with Internet of Things ---

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Sensing, Wireless Networking, Data Collection, Analysis and Processing Technologies for Ambient Intelligence with Internet of Things" in the April 2019 issue.

In the Internet of Things (IoT) era, sensor networks gather ambient information from peoples, products, and sensing devices for real space. The sensed data is processed, analyzed, and applied for enhancement or assistance for human activities, which is called ambient intelligence. Sophisticated social environments such as efficient electric power usage in smart grids, effective transportation systems, smart agriculture and big data analytics based on sensed data will be established through the ambient intelligence. Ambient intelligence can offer the convenience that before does not have and a radical cost cut by fusing the technologies of various fields. Fundamental researches have been promoted in the field of technologies supporting the ambient intelligence. Toward future generation, it is important to develop such sensing, wireless networking, data collection, analysis and progressing technologies for ambient intelligence. From the above points of view, the special section is planned (scheduled to appear in the April 2019 issue) to publish papers on the related fields.

#### 1. Scope

The scope of this special section includes not only sensing, wireless networking, data collection, analysis and processing technologies but also their multidisciplinary researches for ambient intelligence. Possible topics include, but are not limited to:

- Space sensing, vital sensing, mobile sensing, participatory sensing, cloud sensing ambient interface, device and appliance technologies, embedded software, sensing and control theory, long distance communication, 5G, millimeter wave communication, near field radio communication
- MAC/routing protocols, multi-hop, full-duplex and cooperative communication, QoS control, cross layer design, energy harvesting, green wireless, communication and network theory
- Sensor database, context extraction, mining, location-information technology, stream processing, privacy and security, big data, learning signal processing
- Large scale widening, dependability, IoT, M2M, D2D, cyber physical, operation management, autonomous distributed control

#### 2. Submission Instructions

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## Call for Papers

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

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

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

## 1. Scope

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

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

## 2. Submission Instructions

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● **IEICE Societies and Publications**

Society	Transactions	Editorial Subject Indexes
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<b>B</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
<b>C</b> (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
<b>D</b> (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
<b>Journal of IEICE (written in Japanese only)</b>		

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

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**Basic Membership Charge (UNIT : Japanese YEN)**

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

NOTE

- 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.
- 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.
- 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.
- 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](mailto:member@ieice.org) FAX: +81 3 3433 6659 Please fill out the application form printed on the next page.



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

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

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

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

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

**Sister Society membership information**

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

Sister Society:     IEEE ComSoc         KICS         VDE-ITG

Membership number (Member): \_\_\_\_\_

Copy of Membership certificate or Membership card:

(Attached here)

## 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](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	1 <sup>st</sup> , Mar.	1 <sup>st</sup> , Jun.	1 <sup>st</sup> , Sept.	1 <sup>st</sup> , Dec.
Call for newsletters	1 <sup>st</sup> Mon., Dec.	1 <sup>st</sup> Mon., Mar.	1 <sup>st</sup> Mon., Jun.	1 <sup>st</sup> Mon., Sept.
Contribution entry	4 <sup>th</sup> Fri., Dec.	4 <sup>th</sup> Fri., Mar.	4 <sup>th</sup> Fri., Jun.	4 <sup>th</sup> Fri., Sept.
Submission of Manuscript/Copyright	3 <sup>rd</sup> Fri., Jan.	3 <sup>rd</sup> Fri., Apr.	3 <sup>rd</sup> Fri., Jul.	3 <sup>rd</sup> 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](mailto: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](mailto: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](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](mailto: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](mailto:cs-gnl@mail.ieice.org)

## From Editor's Desk

### ● Season's greetings

IEICE General Conference will be held at Tokyo Denki University, Tokyo, from 20<sup>th</sup> to 23<sup>rd</sup> March 2018. Complete English sessions are also scheduled in the conference to promote globalizations of IEICE's academic activities. The campus is located in downtown Tokyo. The welcome party will be also held on 20<sup>th</sup> March 2018, the first day of IEICE General Conference. Various students and business persons will gather and communicate each other while enjoying drinking and eating some foods. From this year, this welcome party will be organized jointly by the ESS, NOLTA, CS, ES and ISS.

Please check out the latest conference information on the IEICE web site at:  
[http://www.toyoag.co.jp/ieice/E\\_G\\_top/e\\_g\\_top.html](http://www.toyoag.co.jp/ieice/E_G_top/e_g_top.html)

IEICE-CS GLOBAL NEWSLETTER Editorial Staff

### Editorial Staff of this issue

No special order is observed.



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*Director, International Publication, IEICE Communications Society*



# Call for Papers

## 2018 IEEE International Workshop on Electromagnetics: Applications and Student Innovation Competition

August 29-31, 2018, Nagoya, Japan



### Organizing Committee

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Yoshihiko Kuwahara  
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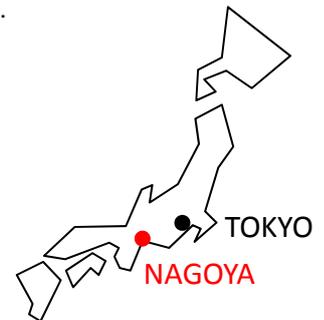
Shinichiro Matsuzawa (TOYOTA  
Central R&D Labs. Inc., Japan)

#### Secretariat:

Kazunari Kihira  
(Mitsubishi Electric Corp., Japan)  
Hiroaki Nakabayashi  
(Chiba Inst. of Tech., Japan)

iWEM started in Taipei in 2010 for the first time as “International Conference on Applications of Electromagnetism and Student Innovation Awards” (2010 ICAE/SIA), and it then continued but renamed in Taipei in 2011 as “IEEE International Workshop on Electromagnetics: Applications and Student Innovation Competition” (2011 IEEE iWEM). Supported by IEEE, this workshop series will be held in rotation in Taiwan, China, Hong Kong, and Japan. Different from other recognized conferences and/or workshops, this workshop series focuses more on student innovation competition and runs in a single session format. It provides not only an international platform for scientists and engineers to exchange their ideas, but also a good venue for young scholars and students to demonstrate their innovative results (which may lead to awards).

IEEE iWEM2018 is organized by the IEEE AP-S Nagoya Chapter, and technically co-sponsored by IEEE AP-S Tokyo/Fukuoka/Kansai Chapters, IEEE Nagoya Section, and IEICE Communications Society. The venue of the workshop is Nagoya Institute of Technology, Nagoya, Japan. Nagoya is one of the most historical and industrial cities in Japan. All accepted papers will be included in IEEE Xplore.



### The topics of interest include but are not limited to the following:

- *Electromagnetic Theory*
- *Instrumentation and Measurement*
- *Millimeter Wave, THz Technologies*
- *Microwave Circuits and Systems*
- *Advanced Materials in RF and THz*
- *Wireless Power Transmission and Harvesting*
- *Antennas and Propagation*
- *Wireless Systems*
- *Array Antenna and MIMO System*
- *MMIC, RFIC*
- *EMC/EMI*
- *Other EM Topics*

### Important Dates

- Deadline of paper submission: **June 4, 2018**
- Notification of Acceptance: June 28, 2018
- Early-bird Registration: July 10, 2018

### Paper Submission Guidelines

Authors MUST submit camera-ready papers **up to two A4 pages** including figures by the submission deadline via the workshop website. The paper format and submission guideline will be found at the workshop web page.

### Contact person:

Dr. Kazunari Kihira ([iWEM2018@lab-ml.web.nitech.ac.jp](mailto:iWEM2018@lab-ml.web.nitech.ac.jp))





## 2018 Asia-Pacific Microwave Conference

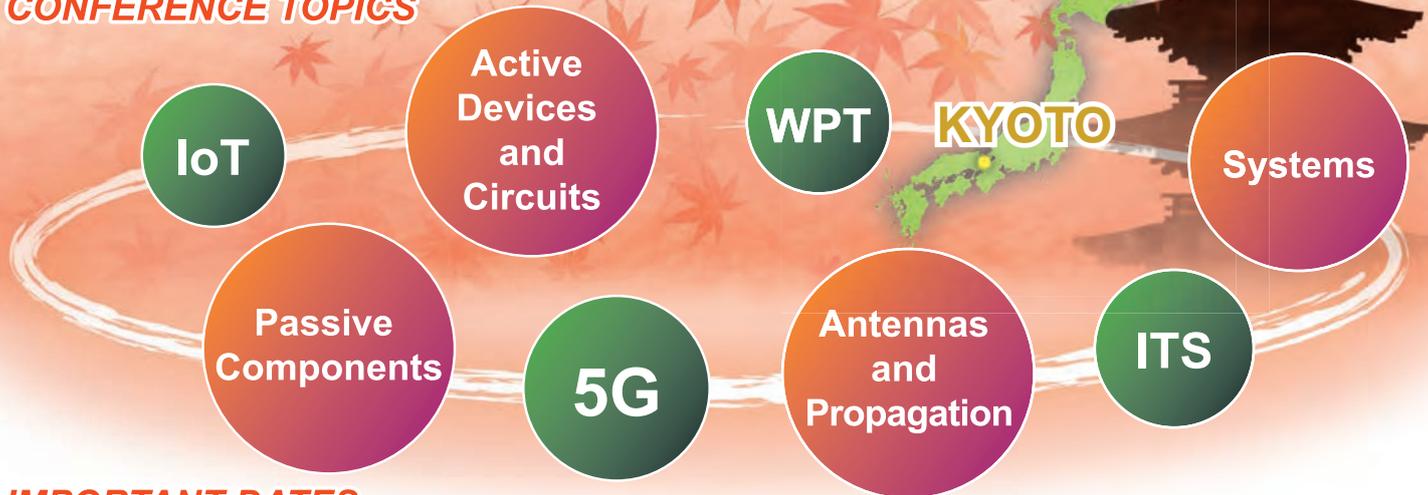
# APMC 2018

November 6-9, 2018, Kyoto International Conference Center, Kyoto, Japan

<http://apmc2018.org/>

### Harmonious World Connected by Microwaves

#### CONFERENCE TOPICS



#### IMPORTANT DATES

- |   |                      |
|---|----------------------|
| ● <b>Proposal Deadline</b> (Workshops/Short Courses/Special Sessions) | <b>Feb. 28, 2018</b> |
| ● <b>Paper Submission Deadline</b>                                    | <b>May 19, 2018</b>  |
| ● <b>Notification of Acceptance</b>                                   | <b>Aug. 10, 2018</b> |
| ● <b>Final Manuscript Upload Deadline</b>                             | <b>Aug. 31, 2018</b> |

#### SCHEDULE OVERVIEW



Organized and sponsored by

**The Institute of Electronics Information and Communication Engineers (IEICE) of Japan**

Technically co-sponsored by

IEEE MTT-S  
IEEE AP-S  
European Microwave Association (EuMA)  
URSI (expected)  
IEEE MTT-S Japan/Kansai/Nagoya Chapters  
IEEE AP-S Kansai Joint Chapter  
IEICE Technical Committee on Microwaves  
IEICE Technical Committee on Electronics Simulation Technology  
IEICE Technical Committee on Microwave Photonics  
IEICE Technical Committee on Integrated Circuits and Devices

IEICE Technical Committee on Electron Devices  
IEICE Technical Committee on Antennas and Propagation  
IEICE Technical Committee on Wireless Power Transfer  
IEICE Technical Committee on Short Range Wireless Communications  
IEICE Technical Committee on Intelligent Transport Systems Technology  
IEICE Technical Group on Terahertz Application Systems  
Japan Institute of Electronics Packaging Japan Society of Electromagnetic Wave Energy Applications  
The Radiation Science Society of Japan  
IEEJ Investigating R&D Committee on Advanced Technology for Progress the Electromagnetic Wave Application  
IEEJ Investigating R&D Committee on Highly Secure-Reliable Wireless Networks

**EIC**



#### APMC 2018 Secretariat

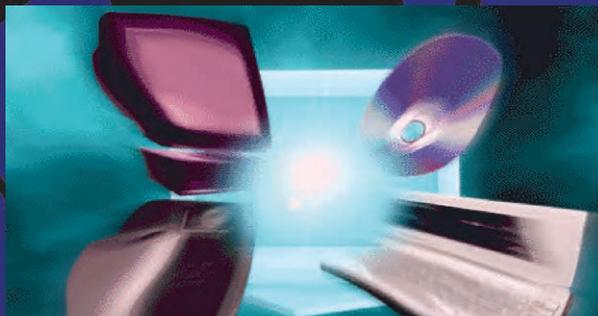
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To Probe Further and Keep Up-to-date with Communication Technologies

# IEICE Communications Society



## IEICE General Conference 2018

20-23 March 2018

Tokyo Denki University Tokyo-senju Campus, Tokyo

Every spring, each Society organizes a General 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\\_G\\_top/e\\_g\\_top.html](http://www.toyoag.co.jp/ieice/E_G_top/e_g_top.html)



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(\*) Depending on material, IEICE membership account, password attached to proceedings DVD, etc. may be required to view PDF contents.



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IEICE Communications Society: [cs-secretariat@ieice.org](mailto:cs-secretariat@ieice.org)