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My Study and Work Experiences in Japan

Zhishu Shen
KDDI Research, Inc.



1. Introduction

The main reason why I chose Japan as a destination to develop my future career is that Japan is similar to China in many ways regarding culture, life, food, etc. Moreover, the flight between my hometown Wuhan and Nagoya/Tokyo takes only four hours. For these reasons, I came to Japan soon after receiving my bachelor's degree in China. I spent five years studying for my master's and PhD degree at Ken-ich Sato/Hiroshi Hasegawa Laboratory, Nagoya University. In 2015, I joined KDDI Corporation, one year later, I was transferred to KDDI R&D Laboratories, Inc. (now KDDI Research, Inc.) where I am currently working as a researcher. This article briefly introduces my study and work experiences in Japan, as well as my life during these years.

2. Study Experience at Nagoya University

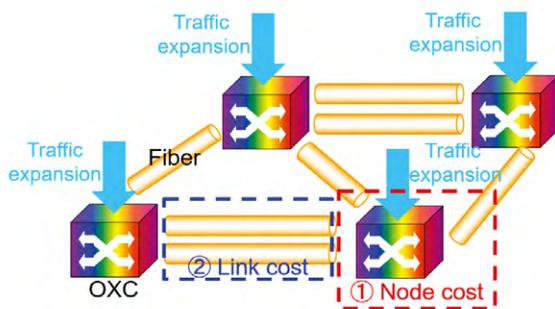
Before arriving in Japan, my biggest concern was whether I would be able to collaborate well with my future colleagues. After arriving at the Laboratory on my first day, my previous worries turned out to be unfounded. Everyone from Prof. Sato to the students were very warm-hearted. Even when they were busy, they still squeezed in the time to help me with everything from research topics to daily life issues. Even now, when I close my eyes, I can see the smiles on their faces. Before I arrived in Japan, I thought everyone was very busy, and yes, they are. But they are also willing to help me. With the help of my colleagues from my research to daily life, along with financial aid from MEXT, I was able to fully focus on my research topic, which was a very lucky situation for a student studying abroad.

The research topic in the Laboratory was related to the development of large capacity photonic network technologies. As shown in Fig. 1, a typical photonic network is primarily composed of two elements: a node (switch/cross-connect equipment), and a link (fiber

including several wavelength paths). However, the limited scale/capacity of existing nodes/links makes it difficult for them to handle rapid growth in the annual increase in traffic, not to mention the additional cost required to accommodate this traffic expansion. To solve these issues, I proposed different strategies to minimize the cost of the nodes and links.

- To construct large-scale nodes, I adopted hierarchical optical path networks as a target. For this network, it groups multiple wavelength paths as one entity (waveband), and the whole group is switched by using a single port as much as possible to directly reduce the node cost. However, the constraint that the same wavelength/waveband cannot be assigned to different wavelength/waveband paths sharing a fiber prevents full fiber utilization. Introducing wavelength/waveband converters can resolve this constraint directly, and I quantitatively evaluated the trade-off between the convertor cost and the fiber utilization ratio [1].
- In terms of the link, the limitation of current photonic networks is that all the channels are spaced at an equally channel distance in the fiber's available spectrum, hence, it is a critical issue to improve the fiber utilization efficiency while accommodating the future high bitrate signal that will require more frequency bandwidth. Herein, I focused on the elastic optical path networks (EON) which utilize a minimum frequency slot granularity and allocate multiple different signals with different frequency slots as needed. The critical issues for EON are the high hardware requirements and spectral fragmentation caused by non-uniform bandwidth assignment. I proposed a semi-flexible-EON which can greatly reduce the complexity of devices while attaining a network performance comparable to that of EON by using a disruption-minimized dynamic rerouting and spectral defragmentation algorithm [2].

Honestly, solving the above research issues all by myself would have been an impossible mission since I was an amateur in the area of photonics networks at the beginning. Fortunately, with the strong professional supports received from members of the Laboratory, I could gradually get on the right path to achieve a satisfactory outcome. I then presented my findings at conferences, and published them in journals, received valuable feedbacks from other experts, and next tried to revise/reconsider the path I had been taking in order to move in a better direction. This is a magical process



OXC: Optical Cross Connect

Fig. 1 Architecture of a typical photonic network

and I then repeated the previous steps. After running this magical process several times, I was able to find a suitable study pace for my research career.

3. Work Experience at KDDI Research

Thanks to my previous study experience in Japan, after graduation, I could join KDDI Corporation; thereby fully putting into practice what I had learnt at university. In the first year, as a temporary assignment for training a new employee, I worked as a network operator in charge of monitoring some of the global networks provided by KDDI. Unlike my previous experience in academic research, it was the first time that I had the chance to manage real-world large-scale networks. Meanwhile, I felt a strong sense of mission in providing and maintaining a high-quality network for every user as a 24/7 service, which is an essential requirement for a telecommunication network that I have studied and worked towards over all these years. The field experience I gained in this work, especially the direct feedback from customers and field engineers, which I had never experienced in my previous academic studies, encouraged me to make further improvements so that the current telecommunication network system could be operated more efficiently.

One year later, I was assigned to KDDI Research, Inc. My topic was related to in-network self-learning on IoT networks. Unlike my previous experience that was focused on core/access network, the IoT network connecting smart appliances is much closer to daily life. Of course, from a research perspective, both IoT network and machine learning which are central to this topic, are new to me. Again, I faced a familiar situation like the one six years ago. However, this time, it was not an impossible mission owing to my previous study experience. Fortunately, again, with the help from experienced colleagues from various professional backgrounds in our company, I endeavored to find a new magical process by which to approach this topic. As an initial solution to the issues involving this topic, Fog computing can be introduced as an intermediate function to minimize traffic between Cloud and large-scale IoT devices (sensors) as shown in Fig. 2. Machine learning is adopted on Fog nodes for an efficient data processing of the massive amount of sensor data that have to be monitored. If anomalous data are detected, the suspected data will be sent to Cloud for further processing. Since the data processing is done by Fog node, the energy consumption and latency caused by

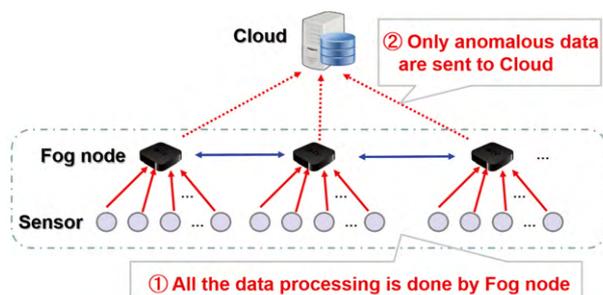


Fig. 2 IoT network enabling Fog computing

data communications and processes in Cloud can be significantly reduced, thereby releasing the precious Cloud resources for other uses. Now I am aiming to further develop this topic from a practical perspective.

4. Life Experience in Japan

For me, traveling is the perfect solution to achieving a good work-life balance, also it provides a good opportunity to visit historical/natural sites, experience different cultures/customs, and moreover, to enjoy good interaction with family and friends. One of the outstanding features of Japan is that you can find the diverse natural environments that include snowy region, mountains, beaches with sunshine, and western/eastern/ancient/modern architecture in the same country, so every time I travel here, I have a different impression.

5. Concluding Remarks

The experiences I have had in Japan are absolutely some of the most valuable and enjoyable in my entire life. Of course, you will have a lot of opportunities, along with encountering tough challenges. The most fulfilling thing for me is to finally overcome these challenges and achieve more than I expected. The most important things I learnt during these years are:

- Collaborate with colleagues and partners: Two heads are better than one, not to mention the assistance that an expert can provide. Hence, actively participating in a discussion or a conference may open another door along your way.
- Set a suitable objective, manage the progress, and then try to realize it under your schedule. If you encounter problems midway, fix them as soon as possible. Do not confine yourself to a narrow area.

I think everybody has their own pace that suits them in their daily work and life. If you can find out what your own pace is, you will be able to design the future.

6. Acknowledgements

I would like to express my gratitude to the editor of IEICE-CS GLOBAL NEWSLETTER for inviting me to share my experiences in Japan with readers. I would also like to take this opportunity to thank all the people, especially my dear colleagues in Nagoya University and KDDI Corporation/KDDI Research, Inc., who helped me greatly to make my research and daily life in Japan run smoothly and comfortably.

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Report on 2017 Asian Wireless Power Transfer Workshop (AWPT2017)

Naoki Shinohara
International Advisory Committee Chairs of AWPT,
Kyoto University



The 2017 Asian Wireless Power Transfer Workshop (AWPT2017) was successfully held at the National University of Singapore (NUS), Singapore, from Dec. 9 to 11, 2017. This workshop was organized by the NUS and co-sponsored by the Technical Committee on Wireless Power Transfer (WPT) of Communications Society, IEICE, and the IEEE Singapore Section.

This is the 3rd workshop which was annually planned by the WPT Technical Committee of IEICE to provide a platform for researchers to share the latest research and development progresses related to the wireless power transfer technology, and to promote exchanges and cooperation among the researchers who are interested and active in this technical field. The 1st AWPT was held in 2015 at Tamkang University, Taipei, Taiwan and the 2nd AWPT was held in 2016 at the University of Electronic Science and Technology of China (UESTC), Chengdu, China. The AWPT will take place once a year around the Asian countries in the future.

Prof. Yongxin Guo, of NUS, Singapore, and Prof. Qiang Chen of Tohoku University, Japan, and the chair of Technical Committee on WPT of Communications Society, IEICE, served as the General Co-Chairs of the workshop. Dr. John Ho of NUS, and Prof. Kenjiro Nishikawa of Kagoshima University, Japan, served as the Co-Chairs of Technical Program Committee. The workshop was successfully organized owing to the great effort by many professors and students of NUS and other local universities in Singapore, as well as the Secretaries, Secretary Assistants, and many Members of the WPT Technical Committee. The international advisory committee, which consisted of 9 members from 7 countries gave the effective comments to conduct the AWPT.

The AWPT2017 had 57 technical presentations from 7 countries in 8 technical session of

- Circuits
- Antennas
- Rectifier
- Systems I, II, III
- Biomedical I, II

and 2 excellent keynotes of

- Prof. Baoyan Duan (Xidian University, China), “On new developments of Space Solar Power Satellite (SSPS) of China”
- Prof. Minoru Okada (Nara Institute of Science and Technology, Japan), “Non-Beam Wireless Power transfer for Guided Vehicle”

in 3-days program. These technical presentations covered a very wide research area related to the WPT technology, from the devices, circuits design, to the systems and application development. Number of attendees is approximately 70.

The student’s paper award was selected by the TPC. 3 prize winners and their papers were as follows.

- Tung Ngo, Zaw Thet Aung, Yongxin Guo (NUS, Singapore), “Harmonic-recycling Rectifier with Efficiency Improvement and DC Voltage Boost”
- Karam Hwang, Seungyoung Ahn (KAIST, Korea), “Methods of detecting vehicle’s longitudinal and lateral position through wireless power transfer”
- Ippei Takano, Daigo Furuu, Shinji Nimura, Masaya Tamura (Toyohashi Tech., Japan), “Development of Power Receiving Control Circuit for Cavity Resonance Enabled Wireless Power Transfer”

Technical level and quality of the presented papers was high. Singapore was not well known as a country of rich research and development (R&D) of the WPT before. However, we found that there are interesting excellent WPT R&D in Singapore and colleagues in Singapore found Japanese recent R&D of the WPT. We promise future collaboration between Singapore and Japan.

The workshop was partly supported by the funding of activation plan from the Communications Society, IEICE. The WPT Technical Committee is now planning the AWPT2018 in Sendai, Japan. Please visit the website of the WPT2018.

<http://www.ieice.org/~wpt/international/AWPT2018/>



Fig. 1 Attendees of AWPT2017



Fig. 2 Workshop Room



Fig. 4 Banquet



Fig. 3 Award Ceremony

FY2017 Activities of the Technical Committee on Smart Radio and Invitation to SmartCom 2018

Kazuto Yano, Osamu Takyu, Shusuke Narieda, Mamiko Inamori, and Teppei Oyama
IEICE Technical Committee on Smart Radio



1. Introduction

The Technical Committee on “Smart Radio” (TCSR) discusses advanced wireless communication technologies including software radio, cognitive radio, wireless distributed network, and wireless transceiver implementation. The TCSR also discusses an application of other technologies such as machine learning into wireless communications. The TCSR organizes five technical meetings in every year, and one of them is held as an international workshop SmartCom. This reports overviews activities of the TCSR in FY2017, and calls for paper for SmartCom 2018, that will be held at Bangkok, Thailand in this October.

2. Technical Conference in Fiscal Year 2017

2.1 The 1st Conference in May 2017 (in conjunction with WTP 2017)

- Date: May 25th–26th, 2017
- Venue: Tokyo Big Sight (Tokyo)
- Number of talks/presentations: 23
(8 regular papers, 1 invited talk, and 14 technical exhibits)

The 1st conference was held with the collaboration with wireless technology park (WTP), which is a largest exhibition of wireless technologies in Japan. There are two special sections. The first one is a technical exhibition of software and cognitive radio technical expo. 2017. Figure 1 shows the overview of this exhibition. There are 14 exhibitions. The main topics of them are given as follows. 5G cellular system, Millimeter Wave and Related technologies, Multi-Operating System, Spectrum Database, SDN, Satellite Communications, RFIC, Radar, Massive MIMO, and IoT. This is the first time of collaboration between WTP and SR. The attendees of exhibition including the regular person of SR and the person with different field had active discussions. In the second section, the invited talk was held by Prof. Yukitoshi Sanada from Keio University. It is the commemoration for receiving the fellow award from IEICE. The main topic of it is the signal decomposition of Gibbs sampling for MIMO,



Fig. 1 Technical exhibition in May 2017 conference which achieves a highly accuracy for signal decomposition as well as low complexity.

2.2 The 2nd Conference in July 2017

- Date: July 19th – 21st, 2017
- Venue: Hokkaido University (Sapporo)
- Joint TCs: RCS, RCC, NS, ASN
- Topics: Wireless Distributed Network, M2M (Machine-to-Machine), D2D (Device-to-Device), etc.
- Number of papers: 40 (21 regular papers, 16 posters, and 3 invited talks)

This conference contains general session, poster session and invited talk for three days. This conference being held on July includes the WDN session in every year, which has been jointly coordinated by TCs.

Poster session (WDN session)

Topics and key words in the poster session as follows:

- ✧ Cognitive Radio (2 posters)
- ✧ IEEE 802.xx (2 posters)
- ✧ M2M (1 poster)
- ✧ Massive MIMO (1 poster)
- ✧ mmWave (1 poster)
- ✧ Monitoring system (1 poster)
- ✧ NOMA (1 poster)
- ✧ OFDM (1 poster)
- ✧ Physical layer network coding (1 poster)
- ✧ SDR (1 poster)
- ✧ Traffic navigation (1 poster)
- ✧ WSN (3 posters)

General session (including WDN session)

The WDN session has 14 papers. The WDN session includes the following topics:

- ◇ 24 GHz-band Doppler radar
- ◇ Adaptive communication procedures
- ◇ Adaptive back-off control procedures
- ◇ Cellular networks analyses
- ◇ Cloud cooperation
- ◇ Compressed sensing
- ◇ Full-duplex wireless networks
- ◇ LPWA communication systems
- ◇ M2M wireless access networks
- ◇ Visible light communications

The common general session organized by TCSR has 7 papers. The topics of the general session is as follows:

- ◇ 1-bit delta-sigma DAC
- ◇ Channel access for spectrum sharing system
- ◇ Energy detection based spectrum sensing
- ◇ Network sharing for 5G networks
- ◇ Overlap FFT filter-bank
- ◇ TV White-space based wide area mobile communication systems
- ◇ V2V wireless networks

Invited talks (Wireless Distributed Networks)

- ◇ “A Study on Fast Throughput Prediction Using Probability Distribution for IEEE 802.11 Wireless LAN,” Chisa Takano (Hiroshima City Univ.), Ryo Hamamoto (NEC Corporation), Hiroyasu Obata, Kenji Ishida (Hiroshima City Univ.)
- ◇ “Communication Behavior -Analysis of behavior generating communication traffic-,” Sumaru Niida, Shuuichi Nawata, Masaki Suzuki and Hideyuki Koto (KDDI Research, Inc.)
- ◇ “Wireless Networking towards Super Smart Society, - Fundamental Technologies in IoT Era-” Takashi Watanabe (Osaka Univ.)

2.3 The 3rd Conference in October 2017 (SmartCom 2017)

- Date: October 23th–24th, 2017.
- Venue: Grand Hotel Palatino (Rome, Italy)
- Number of talks/presentations: 51
(2 opening/closing talks, 2 keynote talks, 16 invited talks, 28 posters, and 3 technical exhibits)

The 3rd technical conference in FY2017 was held as the fourth international technical workshop of TCSR (SmartCom 2017) co-organized by TCSR and TCSRW and supported by TCRCS. This was held in Rome, Italy. Please see its detail in [1].

2.4 The 4th Conference in January 2018

- Date: January 25th–26th, 2018
- Venue: Fukuoka University (Fukuoka)
- Joint TCs: None
- Topics: IoT, etc.

- Number of papers: 18
(15 regular papers, and 3 invited talks)
- Number of participants: 57 in total

The technical conference in January 2018 was held in Fukuoka. Every January, we have a technical conference specifically for Smart Radio. This year, Fukuoka University was the selected venue. Fukuoka University is very accessible from the airport and the city. We had a two-day conference and a total of 18 papers were presented.

On the first day of the conference, presentations included 4 regular technical papers and 2 invited talks from Mr. Matsuo from Fukuoka city office and Prof. Ishikawa of Hiroshima City University. Mr. Matsuo explained that Fukuoka city’s promotion of industries related to IoT and their activities. Prof. Ishikawa talked about an epidemic of spatial modulation and its historical background over the past 50 years. All the talks were very interesting and they took many questions from the audience.

After their talks, the banquet and the evening session were held at Hakata-Hyoutei, which is a popular Japanese restaurant near Tenjin station. The dinner included delicacies famous to the Genkainada sea. The evening session included a discussion on how the technical committee can further support and facilitate research activities beyond the technical group members. We divided the attendees including students into four groups to interact over generations. The attendees had a productive discussion.

On the second day, 11 regular technical reports and 1 invited talk were presented. Prof. Miguel of The University of Liverpool talked about the recent trends for the increase of mobile network capacity in licensed and unlicensed spectrum.

Overall, this conference was very fruitful. We appreciate the time taken by the attendees to be at the conference!



Fig. 2 Banquet in January 2018 conference

2.5 The 5th Conference in February-March 2018

- Date: February 28th – March 2nd, 2018
- Venue: Yokosuka Research Park (Yokosuka)
- Joint TCs: RCS, SRW
- Topics: Mobile Communication Workshop
- Number of papers: 19
(14 regular papers, 2 requested talks, and 3 invited talks for panel discussion)

In this conference, the TCSR organized three general sessions, two special sessions focused on applications

of machine learning/artificial intelligence on wireless communications. In addition, one panel discussion was jointly organized by the TCRCS, TCSR and TCSRW.

Special Session on Machine Learning/Artificial Intelligence on Wireless Communications

Machine learning and artificial intelligence are expected as useful tools for control of wireless system, management of wireless network, and prediction of radio environment. In this conference, the TCSR organized two sessions to introduce two special sessions to introduce latest research activity on this topic. Two requested talks listed below and five general talks were given in the sessions.

- ◇ “Machine Learning Based Regression of Fingerprint Database for Unknown Radio Localization,” Azril Haniz, Gia Khanh Tran, Kei Sakaguchi, Jun-ichi Takada (Tokyo Tech.), Toshihiro Yamaguchi, Tsutomu Mitsui, and Shintaro Arata (Koden Electronics)
- ◇ “Augmented Learning of Wireless Communication Environment for Forwarding Frequency Spectrum Sharing,” Osamu Takyu (Shinshu Univ.), Koichi Adachi (UEC), Mai Ohta (Fukuoka Univ.), and Takeo Fujii (UEC)

Panel Discussion

One panel discussion was jointly coordinated by TCs about “New use cases and communication technologies in 5G era” was held. This special session had the following invited talks:

- ◇ “Introduction of 5G in Remote Machinery Construction - The New Challenge in Unmanned Construction -,” Hiroshi Furuya (Obayashi)
- ◇ “mmWave V2V2X for Automated Driving,” Kei Sakaguchi (Tokyo Tech.)
- ◇ “60 GHz Band High Rate Close Proximity Radio System conforming to the IEEE 802.15.3e standard and extended its application,” Toru Taniguchi (HRCPC)

The TCSR co-organized a panel session to discuss new use cases and communication technologies in 5G era with TCRCS and TCSRW. The first talk introduced some examples of remote control of construction robots for unmanned construction, and ongoing trial of 5G mobile communication system for this use case. The second talk introduced some studies of autonomous driving using V2V2X communications in a millimeter wave band. For this purpose, a dynamic map constructed using sensing data obtained by light detection and ranging is shared among cars using 5G mobile communication system. The third talk introduced a “60 GHz band high rate close proximity radio system” using IEEE 802.15.3e standard, and an information gate system as its application. After these talks, the panelists and audience discussed the requirement of wireless communication system for

introduced use cases, and the expectation for 5G technologies and wireless communication systems.

3. Awards for Presentations in Fiscal Year 2017

The TCSR gives three awards to good papers and technical exhibition presented/made in its technical conferences every year. Best paper award is given for the best paper presented in each year. Research incentive award is given for young researchers who made significant contribution. Special technical award is given for the best technical exhibition. The award recipients are as follows.

For 2016:

- Best paper award
 - ◇ Doohwan Lee, Hirofumi Sasaki, Hiroyuki Fukumoto, Ken Hiraga, Tadao Nakagawa, Hiroyuki Shiba (NTT), “Beam propagation control method for OAM multiplexing using Gaussian beam.”
- Research incentive award
 - ◇ Mai Ohta (Fukuoka Univ.), “Study on false alarm probability reduction method using FFT for spectrum sensing to unknown signals.”
 - ◇ Koya Sato (UEC), “A spectrum database-assisted geostatistical radio propagation estimation for wireless distributed networks.”
 - ◇ Ryota Kosaka (Tokyo Tech.), “Indoor localization system based on multiple AP and its experimental investigation.”
- Special technical award
 - ◇ Doohwan Lee, Hirofumi Sasaki, Hiroyuki Fukumoto, Ken Hiraga, Tadao Nakagawa, Hiroyuki Shiba (NTT), “An experimental study of the orbital angular momentum (OAM) multiplexing.”

For 2017:

- Best paper award
 - ◇ Takashi Maehata (SEI), Suguru Kameda, Noriharu Suematsu (Tohoku Univ.), “Distortion compensation method with asymmetric waveform consideration in concurrent dual-band 1-bit bandpass delta-sigma modulator.”
- Research incentive award
 - ◇ Koji Ichikawa (UEC), “Transmitter identification using hidden Markov model for radio environment map construction.”
 - ◇ Akihide Nagamine (Tokyo Tech.), “Feature detection scheme using cyclic prefix (CP) in OFDM signal - Hardware implementation of feature detector and its characteristics -.”
 - ◇ Kei Inage (TMICT), “Accuracy improvement of measurement-based spectrum database using self-organizing maps.”
- Special technical award
 - ◇ Keiichi Mizutani, Akihito Yoshito, Hiroto Kuriki, Takeshi Matsumura, Hiroshi Harada (Kyoto Univ.), “An experimental evaluation of UTW-OFDM on LTE downlink system for 5G.”

4. Other Remarkable Activities

4.1 Society Conference

Two panel discussions were organized by the TCSR during 2017 Society Conference held in Tokyo City University. The first one was entitled “Smart spectrum technologies in IoT era.” In this panel discussion, four panelists presented their recent research activities or trends of wireless communication technologies for IoT. The topics included the use of LPWA, challenges of wireless communications for factory automation, and radio resource allocation based on QoE. The second one was entitled “mmWave communication technologies for 5G,” which was co-organized by TCRCS and TCSRW. In this panel discussion, seven panelists presented their recent research activities or trends of mmWave communication technologies. The topics included beamforming/massive MIMO, use of mmWave in factories, RoF, and applications enabled by mmWave communications. After the talks, the panelists and audience discussed challenges of wireless communications for better spectrum use and wide deployment of wireless communications.

4.2 General Conference

Two panel discussions and one symposium session were organized by TCSR during 2018 General Conference held in Tokyo Denki University. The first panel discussion entitled “Smart radio technologies for 2020’s supporting Tokyo Olympic Games” had five panelists. They presented and discussed service platform for smart society, efficient spectrum sharing among multiple wireless systems, and mobile network control considering mobile edge computing, and safety solutions using smart radio technologies. The second panel discussion entitled “Trials of 5G systems and expectations” was co-organized by TCRCS, TCNS, TCMoNA, and TCNV. This session had six panelists. They introduced their activities on trial of 5G systems, that are partly supported by Ministry of Internal Affairs and Communications. After the talks, the benefits brought by 5G systems and expectations for 5G systems were discussed. The symposium session entitled “Recent trends of digital RF technologies and its fundamentals” was co-organized by TCMW. Four presenters introduced roles of digital RF technologies on software defined radio (SDR) systems, how to design SDR systems, direct digital RF technologies to capture spectrum with higher frequency than Nyquist frequency, and 1-bit Δ - Σ modulation technology.

5. Call for Papers of SmartCom 2018

- Date: October 30th – October 31st, 2018
- Venue: Bangkok (Thailand)
- Joint TCs: RCS
- Topics: Cognitive radio, Heterogeneous Network, AI technologies for Wireless communications, etc.
- Important Dates:
Registration of paper submission: early Sept.
Camera-ready paper submission: late Sept.

Participant registration: late Sept.

Registration fee payment deadline: late Sept.

SmartCom is the international workshop jointly organized by several IEICE Technical Committees and technical key players outside Japan. This is the 5th SmartCom in its history, and hosted in collaboration with academia in Thailand. The workshop targets on smart wireless communications, and provides a great opportunity for discussing smarter wireless world in future.

The scope of SmartCom 2018 includes radio technologies, spectrum management, wireless networks, communication theory, flexible hardware, and Artificial Intelligence (AI) technologies for wireless systems, among the others. According to recent advancement of wireless technologies, mobile applications, and ubiquitous connectivity, it is required to support huge volume of wireless data traffic, demanding higher data rates. Hence, smart communication technologies to address this data demand are urgently required to sustain future wireless world.

In this workshop, we discuss solutions targeting not only near future but also years beyond 2020, e.g., 5G, beyond 5G and Internet of things (IoT). Expected candidate solutions include small cells, heterogeneous networks including microwave/millimeter wave devices, dynamic spectrum management, machine learning for wireless communications, and so on. The organizing committee expects that the workshop also represents a great opportunity for networking such as for initiating cooperative research and joint proposals.

6. Conclusion

This paper summarized activities of the TCSR in fiscal year 2017. In addition, it also provided a call for papers of SmartCom 2018. The TCSR is always pursuing a possibility to extend its ways by inviting new area of experts, making opportunities to provide useful technical information, and introducing several ways to make more fruitful discussions.

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Web site : <http://www.ieice.org/cs/sr/eng/>

Contact email : sr_ac-sec@mail.ieice.org

Report on the 2018 Vietnam-Japan International Symposium on Antennas and Propagation (VJISAP 2018)

Hiroaki Nakabayashi[†], Takashi Hikage[‡]
[†] Chiba Institute of Technology, [‡] Hokkaido University



1. Introduction

The 2018 Vietnam-Japan International Symposium on Antennas and Propagation (VJISAP 2018) was held at The University of Danang, University of Science and Technology in Danang, Vietnam, from May 30 to June 1, 2018 [1]. This symposium was sponsored and organized by the Technical Committee on Antennas and Propagation of the Institute of Electronics, Information and Communication Engineers (IEICE/AP), and was held in cooperation with the Antennas and Propagation Society Tokyo Chapter of the Institute of Electrical and Electronics Engineers (IEEE AP-S Tokyo Chapter), the Radio-Electronics Association of Vietnam (REV), IEICE Vietnam Section, and IEEE Vietnam Section. The symposium was intended to provide an international forum for the exchange of information on the progress of research and development in antennas and propagation. It was also an important objective of this symposium to enhance the friendship between Vietnamese and Japanese researchers.

2. History of VJISAP

Technical committee on antennas and propagation has performed some conferences in Asian countries since 2014, and VJISAP is one of the conferences. The first VJISAP, VJISAP 2014, was held in Hanoi, Vietnam, during January 8-10, 2014. Thereafter, the second VJISAP, VJISAP 2015, was held in Ho Chi Minh during January 7-9, 2015. The third VJISAP, VJISAP 2016, was held in Nha Trang during February 29-March 1, 2016, and the symposium was held every year in Vietnam. VJISAP 2018 was the fourth VJISAP, was held in Danang. In future, VJISAP will be held in the every second year.

3. Symposium Overview

VJISAP 2018 was held in three days, and an opening ceremony, five oral sessions, and banquet were carried out on the first day. Four oral sessions, a tutorial session, and a closing ceremony were carried out on the second day, and a technical discussion was carried out on the third day. The technical program of VJISAP 2018 consisted of 10 technical oral sessions and a tutorial session. The titles of the technical sessions are as follows.

1. Antennas and Wireless Power Transfer Systems
2. Metamaterial Antennas and Metasurface
3. Tunable Antennas and Antenna Calibration
4. Antenna and Propagation for Body Area Network



Fig. 1 Entrance of venue building



Fig. 2 Opening ceremony



Fig. 3 Oral session

5. Antenna and Wireless Systems 1
6. Antenna and Wireless Systems 2
7. Antenna and Propagation for Radar Applications
8. Antenna and Propagation for 5G communication
9. Antenna Technologies for RF Applications
10. Antenna for Sensing Application and Chirp-based Techniques.



Fig. 4 All participants



Fig. 5 Awarded speakers



Fig. 6 Banquet

The title of the tutorial talking was “Lecture on Technical Writing -Tips for writing technical article-”, and the speaker was Prof. M. Fujimoto at University of Fukui, Japan. The number of the oral speakers was 29 in total (including 4 invited), was 11 from Vietnam and 18 from Japan. The number of the participants was 49 in total, was 17 from Vietnam and 32 from Japan, and all the participants exchanged active arguments. Fig. 1, 2, 3, and 4 show the entrance of venue building, the opening ceremony, the oral session, and all the participants, respectively.

4. Award

The VJISAP 2018 established Young Scientist Award from student papers. Following three papers were awarded (Fig. 5).

1. “Optimized Design of Radar Absorbent Material Using Dielectric Material by Genetic Algorithm,” Y. Ishii, N. Akiyama, K. Gamou, N. Michishita, and H. Morishita, National Defense Academy, Japan.
2. “Unit-Cell Based on Cut Circular Patch for Ka-band Transmitarray,” N. M. Thien, N. T. T. Tuyen, and N. B. Duong, International University Ho Chi Minh City, Vietnam.
3. “Bandwidth Extension of Planar Microstrip-to-Waveguide Transition by Via-hole Arrangement,” T. Nguyen, K. Sakakibara, and N. Kikuma, Nagoya Institute of Technology, Japan.

We hope to report excellent studies for the prize winners in future.

5. Banquet

At the first night, the banquet was held at the restaurant of the top floor of “Belle Maison Parosand Danang Hotel” which is located along My Khe Beach. Participants enjoyed the delicious Vietnamese food and beverage (Fig. 6).

6. Conclusion

The steering committee of VJISAP 2018 thanks to all participants and people related the symposium. We believe that all participants were satisfied with the symposium. We look forward to meeting many researchers in next VJISAP.

7. Reference

- [1] Website of VJISAP 2018, IEICE Technical Committee on Antennas and Propagation, http://www.ieice.org/~ap_ac/jpn/index.php?vjisap2018.

Annual Report of Technical Committee on Information Networks (IN)

Hiroaki Karasawa[†], Tatsuro Kimura[†], Kazuaki Ueda^{††},
and Nobutaka Matsumoto^{††}
[†]NTT Corporation, ^{††}KDDI Research, Inc.



1. Introduction

The technical committee on Information Networks (IN) is one of technical committees of the Communications Society of the IEICE [1]. The IN addresses a broad spectrum of issues associated with information networks and provides a forum for researchers and engineers to discuss various research and development topics. The chairman is Prof. Katsunori Yamaoka of Tokyo Institute of Technology. The vice chairman is Mr. Takuji Kishida of NTT Corporation. The secretaries are Mr. Tatsuro Kimura, Mr. Hiroaki Karasawa of NTT Corporation and Mr. Nobutaka Matsumoto, Mr. Kazuaki Ueda of KDDI Research, Inc. This document presents the IN's annual report for activities from April 2017 to March 2018.

2. IN Activities

The IN is one of the most active technical committees of the IEICE Communications Society. The IN held eighteen days technical meetings from April 2017 to March 2018, some of which are co-organized with another institute (IEE) or other technical committees in IEICE (RCS, NV, ICT-SG, CS, NS, ICTSSL, CNR, MoNA, IA, and ICN). Many researchers participated in the meetings and reported their latest technical research and development results. The venues and the main topics of each meeting are shown in Table 1.

Each technical report is submitted in a paper and published as a Technical Report of the IEICE. Authors of selected papers have received the 24th Information Networks Research Awards, and the young first authors (32 years old or less) of selected papers have received the 3rd Young Researcher Awards of Information Networks in March 2018 (Fig. 1 and 2).

This year, the following three excellent papers were selected from 137 papers for the 24th Information Networks Research Awards.

- Kazuaki Ueda, Atsushi Tagami, Rikisenia Lukita, Shinichi Aikawa, and Jacopo De Benedetto, “An experimental study on NDN-based adaptive video streaming over EU-JP ICN testbed”
- Yuki Udagawa and Osamu Mizuno, “A Study on the Traffic Off-Load Function in Flow-Level Routing Method”

- Toru Mano, Takeru Inoue, Kimihiro Mizutani, Shin-ichi Minato, and Osamu Akashi, “Network Reduction Method that Minimizes Total Capacity Change for Virtual Network Embedding Acceleration”



Fig. 1 Winners of IN Research Award in 2017 (From left to right) K. Yamaoka (Chairman), O. Mizuno, Y. Udagawa, K. Ueda, S. Aikawa, and T. Kishida (Vice chairman)



Fig. 2 Winners of Young Researcher Award of IN in 2017 (From top to bottom) S. Iwai, N. Mikamoto. (Left) K. Yamaoka (Chairman), (Right) T. Kishida (Vice chairman)

In addition, two young authors won the 3rd Young Researcher Awards of Information Networks. The selected papers are as follows.

- Soichiro Iwai, Fumio Teraoka, and Kunitake Kaneko, “Graph replication for wide range graph acquisition in wide area autonomous distributed graph system”

- Naoya Mikamoto, Yoichi Utsunomiya, and Takashi Okuda, “A Verification of Effect of Malicious User on Delay Tolerant Network”

3. Reference

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

Table 1 Technical meeting schedule

Date	Venue	Main topics	Num. of reports	Num. of participants each day
May 11-12 2017	Kikai-Shinko-Kaikan Bldg. (Tokyo)	Wireless Internet, Multi-hop Network, Mesh Network, Network Coding, Cross Layer Technique, Wireless Communication, etc.	6	58, 54
Jun. 15-16	Koriyama Labor Welfare Center (Koriyama)	Home Area Network (HAN), Green/Energy Saving ICT, Smart Grid, Contingency Plan/BCP, Data Analysis/Processing Platform, Big Data, etc.	7	32, 27
Jul. 18-19	Japan Red Cross Hokkaido College of Nursing (Kitami)	Nursing & ICT, Cloud Networking, SDN, OpenFlow, Virtual Private Network (VPN), Overlay Network/P2P, Network Configuration, etc.	8	15, 15
Sep. 7-8	Research Institute of Electrical Communication, Tohoku Univ. (Sendai)	Post IP Networking, Next Generation Network (NGN)/New Generation Network (NWGN), Contingency Plan/BCP, Network Coding/Network Algorithms, Session Management (SIP/IMS), Internetworking/Standardization, Network Configuration, etc.	9	68, 73
Oct. 10-11	Shizuoka Earthquake Disaster Prevention Center (Shizuoka)	Disaster Control, etc.	4	27, 20
Nov. 16-17	Kitakyushu International Conference Center (Kitakyushu)	Application-aware Network Design, etc.	7	48, 37
Dec. 14-15	Hiroshima City Univ. (Hiroshima)	Performance Analysis and Simulation, Robustness, Traffic and Throughput Measurement, Quality of Service (QoS) Control, Congestion Control, Overlay Network/P2P, IPv6, Multicast, Routing, DDoS, etc.	24	56, 40
Jan. 22-23 2018	WINC AICHI (Nagoya)	Contents Delivery/Contents Exchange, Social Networking Service (SNS), Data Analysis/Processing Platform, Big Data, etc.	19	40, 29
Mar. 1-2	Phoenix Seagaia Resort (Miyazaki)	General Topics and Workshop	56	155, 179

Annual Report of Technical Committee on Communication Systems

Masamichi Fujiwara†, NTT; Kenji Kanai†, Waseda Univ.;
Kazutaka Hara‡, NTT; Kentaroh Toyoda‡, Keio Univ.;
Jun Terada**, NTT; Hidenori Nakazato*, Waseda Univ.

*Chair, **Vice-Chair, †Secretary, ‡Assistant, CS Technical Committee,
Web page: <http://www.ieice.org/cs/cs/>



1. Introduction

Technical Committee on Communication Systems (CS) actively organized seven technical conferences and one special workshop at various cities in Japan, in FY2017. We also technically co-sponsored one international conference, which is our first experience of collaborating with an academic organization in Middle East. In this report, we describe our activities which include seven technical conferences, Communication Systems Workshop (CSWS), special and general sessions on IEICE Society Conference 2017 and IEICE General Conference 2018, CS Technical Committee's Prizes, and Japan-Africa Conference on Electronics, Communications, and Computers 2017 (JAC-ECC2017). Visit our web site (<http://www.ieice.org/cs/cs/>) to obtain the up-to-date information. Our topics of interest include (but are not limited to) the followings:

- Network control,
- Transport,
- Modulation, coding and signal processing,
- Network architecture and implementation,
- Network applications.

We are welcome to make your presentations to our conferences.

2. Summary of CS Technical Committee in FY2017

In Table 1, we summarize the annual activities of CS Technical Committee in FY2015, FY2016 and FY2017. The number of presented papers on technical conferences was around 100 each year in three years. The total number of presented papers on IEICE Society and General Conferences is more than 100 in average. Special sessions on those conferences were very well attended because there were latest technical topics and its trends. The number of participants of CS workshop was more than 30 in average.

We had many interesting special invited talks by outstanding speakers in each conference. One of the most impressive talks was presented by Prof. Iwao Sasase of Keio University in CS technical conference on 27th July 2017 in Fukue Island (Fig. 1). He viewed his academic activities and experiences for many years and also proposed the roll of academic meetings and activations. His talk greatly inspired enthusiasm in young audiences who gave poster presentations at the student session in July conference. In December conference, Prof. Masayuki Tanimoto presented an overview of his works on Free-viewpoint Television (FTV) technologies and also introduced his promotion activities toward the realization of the international

Table 1 Summary of CS Technical Committee annual activities

	Number of presented papers		Special session on IEICE Society Conference (Number of participants)	Special session on IEICE General Conference (Number of participants)	Number of participants of CSWS
	Technical Conferences	IEICE Society/General Conferences			
FY2015	97	45/77 (122)	-Mobile Optical Networks for Next Generation Mobile Communications System (5G) (61) -Recent progress of Internet of Things (IoT) and its application to cyber physical (37)	Simulation technology in information and communication fields (31)	35
FY2016	97	52/72 (124)	Cooperation of edge computing and access network for IoT (62)	- Network Technologies toward IoT (101) - Toward Future Network Innovation in IEICE Communications Society (46)	36
FY2017	114	29/55 (84)	Promotion of research and development toward future ICT (60)	- History and Challenge in optical access network (54) - IoT over All (56)	28



Fig. 1 Prof. Iwao Sasase giving an invited talk at CS technical conference in Fukue Island on 27th July 2017



Fig. 2 Prof. Masayuki Tanimoto giving an invited talk at CS technical conference in Nagoya Univ. on 30th November 2017

standardization of FTV (Fig. 2).

Through the FY2017, we had many valuable special invited talks. To refer them, please visit our archive web page (<http://www.ieice.org/cs/cs/special-e.html>).

In addition to the above, we organized the special invited session on “ICT technologies in Japan” in JAC-ECC2017 [1] (Fig. 3). JAC-ECC2017 is the international conference in the fields of electronics, communications, and computer engineering which was organized by international collaboration between Kyushu University in Japan and Egypt-Japan University of Science and Technology (E-JUST) in Egypt and held on December 18th-20th, 2017 at Hilton Alexandria Green Plaza, Alexandria, Egypt. We invited six outstanding Japanese researchers who are members of IEICE and experts in ICT. Impressive invited talks from academia and industry presented topics such as 5th-generation optical and wireless access, Internet-of-Things (IoT) technologies, software-defined network, and network controls as well as brief introduction of IEICE activities. Please refer to Ref. [1] for more information about JAC-ECC2017.



Fig. 3 Scenes in JAC-ECC2017. (a) Organizing committee members and participants. (b) Example of invited speakers from Japan, Prof. Miki of Univ. of Electro-Comm. (left), Prof. Adachi of Tohoku Univ. (middle), Dr. Suzuki of NTT (right)

Table 2 Technical Conferences schedule, May 2018 – April 2019

Date	Venue	Joint committee	Topics
Jul. 11 – 13	Eef Information Plaza (Kume Island)	–	Next Generation Networks, Access Network, Broadband Access System, Power-Line Communications, Wireless Communication Systems, Coding System, etc.
Sep. 6 – 7	Tohoku Univ.	NS, IN, NV	Post IP networking, Next Generation Network (NGN)/New Generation Network (NWGN), Contingency Plan/BCP, Network Coding/Network Algorithms, Session Management (SIP/IMS), Internetworking/Standardization, Network configuration, etc.
Oct. 31– Nov. 2	TBA (Dougo-onsen, Ehime)	CSWS	Broadband Access Systems, Home Networks, Network Services, Applications for Communications, etc.
Nov. 29 – 30	Tokushima Univ.	IPSJ-AVM, IE, ITE-BCT	Image coding, Communications and streaming technologies, etc.
Jan. 17 – 18	Nobumoto Ohama Memorial Hall (Ishigaki Island).	OCS	Network Core/Metro Systems, Submarine Transmission Systems, Optical Access Systems/Next Generation PON, Ethernet, Optical Transport Network (OTN), Transmission Monitoring and Supervisory Control, Optical Transmission System Design/Tools, Mobile Optical Network
Mar. (TBA)	TBA	CAS	Network Processor, Signal Processing Circuits for Communication, Wireless LAN/PAN, etc.
Apr. (TBA)	TBA	CQ	Optical/Wireless Access and Their Integration, QoS and QoE, Assessment/Measurement/Control/Optimization of Communication Quality, Network Services, etc.

3. Activities of CS Technical Committee in FY2018

3.1 Technical Conferences

July conference will be held on 11th-13th July 2018, in Kume Island, with two special invited speakers and 28 invited and general session speakers. First special invited talk is given by Prof. Tetsuya Yokotani of Kanazawa Institute of Technology. The presentation title is “R&D and International Standardization”. Second special invited talk is given by Dr. Hiroo Suzuki of NTT. The presentation title is “Cyber Security: Lessons learned from actual case study”.

We are planning to have seven conferences in this year, which are shown in Table 2. We appreciate your entry to them. You can obtain detailed information at our web site (<http://www.ieice.org/cs/cs/>).

3.2 Special Sessions on IEICE Society and General Conferences

CS Technical Committee will organize a tutorial session of “ICT x SPORTS: Applications and Technologies” on 12th September 2018, in the IEICE Society Conference 2018 (September 11th-14th, 2018, Kanazawa Univ., Ishikawa). Outstanding speakers will be invited.

For the IEICE General Conference 2019 (March 19th-22nd, 2019, Waseda Univ., Tokyo), we are now planning to have a highly motivated symposium session.

3.3 CS Workshop

CS Workshop 2018 will be held in Ehime, from 31st October to 2nd November 2018. Prof. Osamu Muta, General Chair of the workshop, has invited several outstanding researchers for providing talks about various categories. Please visit to the web site for more information:

(<http://www.ieice.org/cs/cs/jpn/cs/ws/index.html>).

3.4 CS Prizes

CS Technical Committee provides prizes to authors or speakers who made good presentations and excellent papers every year. The detailed information on the committee’s prizes is described in Table 3.

Table 3 CS committee’s prizes

Chairman’s prize	Summary: The aim of the chairman's prize to the superior papers is activating investigations on communication systems engineering.
	Candidates: The paper must be submitted to the IEICE committee on communication systems.
Encouraging prize	Summary: The aim of the encouraging prize to the excellent speakers is encouraging young researchers who are engaged in communication systems engineering.
	Candidates: The speaker must be less than 33 years of age at the time of the workshop in which the speaker made a presentation. His/her paper must be submitted to the IEICE committee on communication systems.

The winners of the chairman’s prize in 2017 are the authors of three papers [2-4]. The speakers of the papers are Mr. Syuto Kibe, Mr. Goji Nakagawa, and Mr. Koki Matsuzaki.

The winners of the encouraging prize in 2017 are the speakers of three papers [5-7], Mr. Kei Sakuma, Dr. Hikaru Kawasaki, and Mr. Tomoya Kageyama.

Five invited talks by the speakers of CS2017-58, CS2017-59, CS2017-105, CS2017-100, and CS2017-104 will be conducted and the prize ceremony 2017 will be held at the technical conference in Kume Island on July 12th, 2018.

4. Conclusion

This report has summarized activities of Technical Committee on Communication Systems in FY2017. Any comments and feedbacks are appreciated to improve our activities. We welcome your submission to our conferences (<http://www.ieice.org/cs/cs/>).

5. References

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Annual Report of Technical Committee on Network Systems

Yoshikatsu Okazaki[†], NTT Corp.

Akihiro Nakao^{††}, Univ. of Tokyo

Hideki Tode^{†††}, Osaka Pref. Univ.

Kenichi Matsui^{††††}, NTT Corp.

Yosuke Tanigawa^{††††}, Osaka Pref. Univ.

Kazuya Tsukamoto^{†††††}, Kyushu Inst. of Tech.

[†]Chair, ^{††}Vice Chair, ^{†††}Former Chair, ^{††††}Secretary, ^{†††††}Former Secretary



1. Introduction

This report covers the annual activities of the IEICE Technical Committee on Network Systems (NS). It describes activities at the monthly technical meetings, recent research topics of the committee, and the research awards for 2017.

2. Technical Meetings

The schedule from April 2017 to March 2018 consists of 10 NS technical meetings, one workshop [1], and additionally, 3 technical meetings of Network Software (NWS) sub-committee (as shown in Table 1). Several meetings are co-located with the ICN (Information-Centric Networking), OCS (Optical Communication Systems), PN (Photonic Network), RCC (Reliable Communication and Control), ASN (Ambient intelligence and Sensor Networks), RCS (Radio Communication Systems), SR (Smart Radio), CS (Communication Systems), IN (Information Networks), NV (Network Virtualization), ICM

(Information and Communication Management), or CQ (Communication Quality) committees.

Recently presented papers mainly focus on technologies that support new generation network, network virtualization, SDN/NFV, cloud computing, green ICT, wireless/ad-hoc networks, ICN/CCN, blockchain, IoT network, Mobile Edge Computing (MEC), network intelligence/AI, Quality of Service/Experience (QoS/QoE), and security issues. At each technical meeting, we host lectures by invited speakers who are experts in their research fields. During this fiscal year, we have had invited lectures on network operation, network design, network architecture, IoT, UAV, machine learning, and other topics. In fiscal 2017, we had 185 presentations from academia and 54 from industry in NS technical meetings.

Since June 2003, we have fostered the work of young researchers who have presented papers at NS technical meetings by inviting them to give a follow-up talk some months later. We call these the “encouragement

Table 1: Technical meeting schedule for fiscal 2017. (Gray cells indicate technical meetings of NWS sub-committee)

Date	Location	Theme	Co-location with
April 20–21	Toyama Shoko Kaigisho (Toyama)	Traffic, Network Evaluation, Performance, Resource Management/Control, Traffic Engineering, Reliability, Resiliency	
May 18–19	Kikai Shinko Kaikan Bldg. (Tokyo)	Advanced Protocol and Network Control, Network System Architecture	ICN
June 8–9	Asahikawa Tokiwa Shimin Hall (Hokkaido)	Network Service, Network Software, Software Technology	
June 15–16	Akita Univ. (Akita)	Ccre/Metro System, Photonic Network System, Optical Network Design, Traffic Engineering, Signaling, GMPLS, etc	OCS, PN
July 19–21	Hokkaido Univ. (Hokkaido)	Wireless Distributed Network, M2M: Machine-to-Machine, D2D: Device-to-Device, etc.	RCC, ASN, RCS, SR
September 7–8	Tohoku Univ. (Miyagi)	Post IP Networking, Next Generation Network, Contingency Plan/BCP, Network Configuration, etc.	IN, CS, NV
October 19–20	Beppu B-ConPlaza (Oita)	Network Architecture, Network Software, Software Technology.	
October 26–27	Osaka Pref. Univ. I-site Namba (Osaka)	Network Architecture (Overlay, P2P, Ubiquitous Network, Active Network, NGN, New Generation Network), Grid, etc	
November 16–17	Takamatsu Center Bldg. (Kagawa)	Network Quality, Network Measurement and Management, Network Virtualization, Network Service, General	CQ, ICM, NV
December 14–15	Hiroshima Aster Plaza (Hiroshima)	Multi-hop/Relay/Collaboration, Sensor/Mesh, Mobile Ad-hoc Network, D2D/M2M, Wireless Network Coding, etc.	RCS
January 18–19	Ishigaki Shoko Kaikan (Okinawa)	Network Software, Network Application, SOA/SDP, NGN/IMS/API, Distributed Control/Dynamic Routing, Grid Network Software for Next Generation Network Service Provisioning	
March 1–2	Phoenix Seagaia Resort (Miyazaki)	General, IN/NS Workshop (March 1)	IN

talk.” We invited 8 young researchers to give such talks in the past year. We will continue this activity.

Moreover, the 3rd night session was held to provide an opportunity for an exchange of views on a given topic in January 2018. In this year, issues on the advanced IoT network technology were discussed among all the participants enthusiastically.

3. Research Awards 2017

The Technical Committee selected recipients of the Network System Research Award from among 209 regular papers that had been presented at monthly NS technical meetings from January to December 2017. The award is given to the authors of the three or four best papers of each year. The 2017 recipients attended the award ceremony at the IN/NS Workshop (Fig. 1) held in Miyazaki in March 2018. The abstracts of the four papers that won awards in 2017 are as follows.

Yutaro Inaba, Yosuke Tanigawa, Hideki Tode: “Content Retrieval Method based on Caching Property Analyses in Cooperation between CDN and Breadcrumbs-based In-network Guidance Method,” [2]

These days, Information Centric Network (ICN) has emerged, that matches current content-centric network usage of the Internet users. However, ICN has various scalability and feasibility challenges because huge amount of contents are distributed in the current Internet.

The authors' research aims to establish the feature of ICN with high scalability and feasibility in combination with conventional IP network. We previously proposed a cooperation method between Content Delivery Network and Breadcrumbs (BC)-based in-network guidance frameworks to improve the performance on content retrieval and acquisition by reducing the workload on origin and surrogate servers and cache miss ratio.

In this paper, first, through extensive performance evaluations for the previously proposed method, we show an interesting and beneficial caching property of the method, in which each popular content is automatically cached on a designated surrogate server without explicit control. By caching each content on a designated surrogate server without duplication, entire cache space is used effectively, and as a result, it is expected that cache miss ratio, origin work load, and surrogate utilization are further reduced.

Therefore, we propose a new method that attains effective utilization of cache capacity. In this method, once a surrogate server provides a content NR times, the user query for the content is transferred to the surrogate server. Queries can be guided also by BC if it finds a BC entry on a router on the way to the surrogate. By setting the threshold NR, it is avoided that locally popular contents are accidentally allocated to a far surrogate server.

Evaluation results demonstrate that the proposed method achieves 83% and 91% reduction of cache miss ratio and origin work load respectively, with a simple

cache allocation control that manages the designated surrogate server for each content at a DNS server, compared with the previously proposed method.

Kenji Sato, Hitomi Tamura, Kazuya Tsukamoto: “Performance Analysis of Dynamic Channel Bonding with Partial Channel Collision,” [3]

In IEEE 802.11 ac wireless LAN, there are several technologies for increasing transmission rate. Channel bonding, which is one of the latest technologies for the wireless LAN, increases transmission rate by using consecutive multiple channels simultaneously. Recently, the numbers of devices using wireless LAN have been increased rapidly. As a result, degradation of communication performance will frequently occur due to channel duplication.

There are two methods for avoid channel duplication: Static Channel Bonding and Dynamic Channel Bonding. When data frame transmission, Static Channel Bonding uses static channel width and Dynamic Channel Bonding uses dynamic channel width. Dynamic Channel Bonding changes channel width each data frame transmission. Therefore, Performance of Dynamic Channel Bonding changes each frame transmission. Dynamic Channel Bonding will be mainstream because Dynamic Channel Bonding implements efficient channel utilization. However, Dynamic Channel Bonding process is obviously complicated more than that of Static Channel Bonding.

There are many literatures relating wireless LAN performance and Static Channel Bonding. However, there is no literature investigating Dynamic Channel Bonding in detail because not only the commercial products but also simulators incompletely implement Dynamic Channel Bonding. In this paper, through queueing theory, we evaluate the performance of Dynamic Channel Bonding in a case where some part of bonding channels is overlapped with other users. We focus queueing theory because it can frame level evaluation.

Finally, we showed that Dynamic Channel Bonding can improve the throughput performance even under the severe channel overlapping condition. In the best case, Dynamic Channel Bonding can increase throughput by 81.8 %.

Takahiro Kubo, Chisa Takano, Masaki Aida: “New Model of Flaming Phenomena in On-Line Social Networks Caused by Degenerated Oscillation Modes,” [4]

The explosive dynamics in on-line social networks represented by flaming phenomena might give a serious impact not only on the sustainable operation of information networks but also on activities in the real world. In order to establish countermeasure technology for the flaming phenomena, it is necessary to understand generating mechanisms of the flaming phenomena with an engineering framework.

This paper discusses a new model of the generation mechanism for the flaming phenomena. The oscillation model on general directed graphs is known as a model that can describe flaming phenomena, and the

oscillation energy describing the strength of users activity diverges if the eigenvalue of the Laplacian matrix is a complex number. On the other hand, if the Laplacian matrix is diagonalizable, the oscillation energy does not diverge on the condition that all the eigenvalues are real numbers.

In this study, we consider the dynamics of networks if the Laplacian matrix is not diagonalizable in case that degenerated oscillation modes exist. In this case, the coupling between degenerated oscillation modes is represented by the Jordan canonical form of the Laplacian matrix. The temporal evolution equations of the phase difference of the oscillation modes are similar to the Kuramoto model that describes phase synchronization. If the synchronization of the phase difference occurs, the oscillation modes increase exponentially with time even if the eigenvalues are real. Divergence of those oscillation modes leads to the divergence of the oscillation energy, and it can be interpreted as the flaming phenomena.

Simulation results show that the synchronization of the phase difference of the oscillation modes leads to exponential increase of the oscillation modes.

Tsuyoshi Yamasaki and Hiroyoshi Miwa: “Method of Determining Recovery Order for Intermittent Link Failures Considering Link Failure Probability,” [5]

High reliability is required for communication networks, and it is important to design and operate a robust network that is resistant to network failures. Particularly, service interruption due to disconnection of a communication path between the nodes must be avoided.

Therefore, there is a lot of research on the network design and control methods to keep high connectivity. On the other hand, the problems on the recovery from network failures by a natural disaster had not sufficiently been investigated so far. The links in network infrastructure are set up with the implicit assumption that after a natural disaster, there is enough time to recover before the next one strikes. However, in the event of a huge earthquake, the frequent aftershocks cause new damage and cause already-repaired links to break down again, which significantly degrade communication quality.

In fact, in the Great East Japan Earthquake in 2011 and Kumamoto earthquake in 2016, road networks and electric networks were damaged by not only the main shock but also the aftershocks. In such a case, material resource and human resource are restricted, all broken links cannot be simultaneously repaired; therefore, they must be repaired one after the other. It is necessary to determine an appropriate recovery order of the broken links, because the difference of the recovery orders causes the different recovery speed of the connectivity of the network. This issue had not been widely acknowledged so far.

In this paper, we aimed to determine an appropriate recovery order of broken links against intermittent link failures. We formulated the optimization problem

determining the recovery order, proved that the problem is NP-hard, and designed a heuristic algorithm. In addition, we evaluated the performance of the algorithm by applying it to the topology of the real networks. The results showed that the proposed algorithm works well.



Fig. 1 NS research award recipients with chair Prof. Tode

4. Future Plans

The Technical Committee will have 10 NS technical meetings in this fiscal year, and also organize open Symposia in the IEICE Conferences, one of which will be on “Compositive Information Communication Technologies and Applications for Future Network Systems” at the IEICE General Conference in March 2019. In addition, as a global activity, the Technical Committee will support the hosting of CloudNet 2018, which will be held at the University of Tokyo on 22-24 in this October, with IEEE ComSoc.

(For more information, please see our home page.

URL: <http://www.ieice.org/cs/ns/eng/index.html>)

5. References

- [1] Kazuya Tsukamoto, Kenichi Kashibuchi, Kenichi Matsui, “Fiscal 2017 Report of Research Trends in Technical Committee on Network Systems,” *IEICE Tech. Rep.*, NS2018-21, May 2018.
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Report on the 6th Korea – Japan Joint Workshop on Complex Communication Sciences

Phan Le Nguyen
Kanagawa Institute of Technology



1. Introduction

The 6th Korea – Japan Joint Workshop on Complex Communication Sciences will be held on January 8-10, 2018 at Jozankei Manseikaku Hotel Milione, Hokkaido, Japan. The workshop is organized in cooperation with the “Complex Communication Sciences (CCS), IEICE”; “Information Network Sciences (NetSci), IEICE”; “Complex Communication Science (CCS), KMMS” and “Korea Multimedia Society (KMMS)”.



Fig. 1 Jozankei Manseikaku Hotel Milione

Conference is held once a year in Japan and Korea in turn. Last time, the conference was organized in Busan, Korea. In this report, we describe this year conference in Hokkaido, Japan.

The purpose of workshop is to provide a forum where professors and students can exchange ideas and understanding about the technology related to complex communication sciences. The conference is an annual playground for Japanese students, professors and researchers who share the strong interest in technology and communication. Through the conference, members of the two countries have the opportunity to meet each other and report the latest research results. On the other hand, the language used in the conference is entirely in English. Therefore, the participants will have the opportunity to improve English.

2. Technical Sessions

Members will present their research by using a presentation or poster. On this 6th conference, there are 12 sections of the presentation report and more than 43

sections of the poster report. Researchers from the two countries, in turn, present their new research in the research presentation session. After that, in the research poster session, posters will be presented in 1 hour.

Research topics are very various which might telecommunication systems in all layers, biological and nervous system, and human and social communication systems. This makes it easy for participants to understand the issues they are interested in, and the researchers can easily answer questions from participants.

The conference is held within 3 days. Besides the research report time, participants will have a party and many tour sightseeing around Hokkaido together, such as Otaru, Sapporo Brewery and ski resorts.

At this conference, researchers from both Japan and Korea not only exchange research fields but also gain knowledge about the cultures and customs of the two countries.

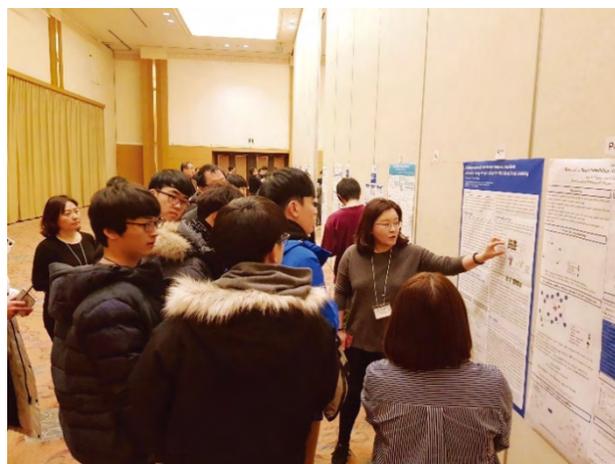


Fig. 2 Poster Session



Fig. 3 Banquet Party



Fig. 4 Best student paper award ceremony

3. Award Ceremony

On the third day of the conference, the Best Student Award will be given to researchers from both Japan and Korea. This conference has 13 posts awarded out of 43 the total number of posts. The award is an encouragement for students in both countries to study and research in the future.

4. Summary

This year's conference in Japan was greatly successful. In addition to exchanging and introducing new techniques, the conference is also a venue for meetings and exchanges to further tighten the friendship between Japan and Korea. Next year, the conference will be held in PyeongChang, Korea where the 2018 Winter Olympics took place. Please come to join and have fun together.

Sister Society Renewal between IEICE-CS and CIC

Akira Yamada¹ and Song Tong²

¹Director, Planning and Member Activities, IEICE-CS

²Deputy Secretary General, CIC



1. Introduction

This letter reports the renewals of the sister society (SS) agreement between IEICE Communications Society (IEICE-CS) and the China Institute of Communications (CIC).

Various benefits are given to members of the IEICE-CS and the CIC under the Sister Society agreement. Benefit includes paper submission, meeting participation, transactions/journal subscription between the IEICE-CS and the CIC. Furthermore, the IEICE-CS and the CIC further seek and give privileges to and cooperate with each other for mutual prosperity.

The first sister society agreement between the IEICE-CS and the CIC was made in the end of 2008, and this is the 3rd renewal of the sister society agreement [1,2]. The new agreement will be valid from Jan. 2018 through the end of 2020.

2. Sister Society Agreement Overview

Members of both IEICE-CS and CIC have benefits by the sister society agreement. Examples of the benefits are as follows:

1. Submit papers to sponsored meetings with the same privileges and limitations as IEICE-CS / CIC members.
2. Register for sponsored meetings at reduced “sister-society” rates.
3. Further seek and give privileges to both societies and cooperate each other for mutual prosperity.
4. Display and distribute printed materials in both sponsored conferences and meetings.

The IEICE-CS and the CIC co-sponsored international conferences such as The 23rd Asia-Pacific Conference on Communications (APCC2017) which was held in Australia, APCC2015, APCC2009 and so on. We further seek the possibility of joint meeting of Technical Group of the IEICE-CS and the CIC and possible promotion which will be beneficial for both members of the IEICE-CS and the CIC.



Fig. 1 Logo of the China Institute of Communications

Table 1 Profile of China Institute of Communications

Founded	May 1978
Headquarter	Beijing, China
Missions	<ol style="list-style-type: none"> 1. Organizing academic and technical exchanges. 2. Providing communication technology, policy and engineering consulting services. 3. Popularizing communication science and technology knowledge, carrying out continuing education and training. 4. Publishing science and technology publications. 5. Organize communication technology exhibitions. 6. Organize private cooperation and exchanges with international academic institutions. 7. Accept commissions, organize communication technology project evaluation and achievement appraisal, select scientific and technological progress award projects, and carry out commendation and reward activities. 8. Technical job qualifications, discovery and recommendation of talents. 9. Other scientific and technological intermediary activities.
Member	70,000 members
Publication	<ul style="list-style-type: none"> - China Communications - Journal of Communications - Telecommunications Science - Modern Communication magazine - China Telecom Industry

3. References

- [1] Hidetoshi Kayama and Takao Naito, “Renewal of Sister Society Agreement between IEICE-CS and CIC (China Institute of Communications),” IEICE Communications Society – GLOBAL NEWSLETTER Vol. 36, No. 2, pp. 28, June 2012.
- [2] Yasunori Suzuki and Yukihiko Okumura, “Renewals of Sister Society Agreement between IEICE-CS and CIC and between IEICE-CS and KICS,” IEICE Communications Society – GLOBAL NEWSLETTER Vol. 40, No. 1, pp. 8, March 2016.

Report on International Workshop on Technology Trials and Proof-of-Concept Activities for 5G and Beyond 2018 (TPoC5G 2018)

Yukitoshi Sanada
Keio University



1. Introduction

International Workshop on Technology Trials and Proof-of-Concept Activities for 5G and Beyond 2018 (TPoC5G 2018) was organized in conjunction with IEEE Vehicular Technology Conference 2018 Spring, which was held in Porto, Portugal, on June 3rd-6th, 2018. TPoC5G 2018 is technically cosponsored by IEEE VTS Tokyo Chapter and IEICE Communication Society. TPoC5G was held at IEEE Vehicular Technology Conference 2017 Spring and it was the second time to be held with the same focus. The workshop focused on the latest trials and evaluation results for 5G and the proof-of-concept activities for beyond 5G.

2. Conference Program

The workshop was held from morning on June 3rd for a full day. There were 14 presentations including keynote presentations. The first keynote presentation in the morning session was provided by Dr. Y. Okumura from NTT DOCOMO. His keynote presentation was titled “DOCOMO’s System Trials for 5G Actualization”. The second keynote presentation was given by Dr. A. Maeder from Nokia Bell Labs. His keynote titled “Making 5G Happen: from Concept to Reality”.



Fig. 1 Keynote presentation by Dr. Okumura



Fig. 2 Keynote presentation by Dr. Maeder

3. Technical Sessions

The workshop consists of four technical sessions; 5G I, 5G II, Signal Processing-I, and Signal Processing-II. There were about 37 participants and intensive discussions were held. The presenters are from Japan, China, Denmark, Germany, and UK. The topics include the follows;

- Field trials of massive MIMO in low SHF and high SHF bands
- Outdoor Experimental Trials of Long Range Mobile Communications
- Field experiment of distributed antenna
- Proof-of-concept of NOMA
- Trial results of URLLC
- Experimental evaluation of coordinated MU-MIMO
- Implementation of video rate prediction based communication
- Field trial on terminal collaborated MIMO reception
- Evaluations of low complexity sphere decoding
- System level simulation of amplified-and-forward relay
- Performance evaluation of robust channel estimation
- PAPR reduction scheme with system impairments for OFDM



Fig. 3 Q&A session

4. Acknowledgement

The TPoC5G committee members would like to give thanks to authors, speakers, participants, and staffs.

Report on the 11th International Workshop on Evolutional Technologies & Ecosystems for 5G Phase II (WDN-5G ICC2018)

Gia Khanh Tran
Tokyo Institute of Technology, Japan



1. Introduction

Following the successful events of the International Wireless Distributed Network (WDN) workshop on Cooperative and Heterogeneous Networks held annually since 2008, the 11th workshop [1] focusing on 5G & Beyond topics e.g. evolutional technologies and ecosystems for 5G Phase II was held in conjunction with IEEE ICC2018 on 20 May 2018 in Kansas City, Missouri, USA. The workshop was technically co-sponsored by IEICE Communications Society and 5G-MiEdge consortium [2], with two featured keynote speeches. This report summarizes the workshop activity, especially focusing on discussion topics on 5G Phase II technologies and ecosystems in the workshop.

2. Workshop Committee

General co-chairs:

- + Prof. Kei Sakaguchi (Tokyo Tech., Japan)
- + Dr. Emilio Calvanese Strinati (CEA-LETI, France)
- + Dr. Thomas Haustein (Fraunhofer HHI, Germany)

TPC co-chairs:

- + Dr. Gia Khanh Tran (Tokyo Tech., Japan)
- + Prof. Sergio Barbarossa (University of Rome, Italy)
- + Dr. Antonio de Domenico (CEA-LETI, France)
- + Dr. Valerio Frascolla (Intel, Germany)

Publicity chair:

- + Dr. Markus Dominik Mueck (Intel, Germany)
- + Dr. Mauro Boldi Renato (Telecom Italia, Italy)
- + Dr. Kentaro Ishidu (NICT, Japan)
- + Dr. Marco Mezzavilla (NYU, USA)
- + Prof. Yonghui Li (Sydney Univ., Australia)

3. Scope and Objectives

Current research efforts on 5G Radio Access Networks (RAN) strongly focus on millimeter-wave (mmWave) access for addressing a critical weakness of deployed cellular systems, i.e. the capacity to realize enhanced mobile broadband (eMBB) services, as discussed at the World Radio-communication Conference 2015 (WRC-2015). Foreseeing a new market, the FCC in US also opened up in total nearly 11 GHz of spectrum above 27.5 GHz to 5G, including unlicensed spectrum at 64-71 GHz. Aside, mmWave technologies have reached a significant degree of maturity and their state-of-the-art products, operated in the 60 GHz unlicensed band, are already in the market. Wireless engineers and business planners now consider how to efficiently introduce and operate mmWave in 5G and beyond, where the answers to the question

depend on scenarios/use cases/services to be deployed. For example, the forthcoming 5G Phase II, taken care by the planned 3GPP Release 16, is particularly interested to a new class of services called ultra-High Speed Low Latency Communications (uHSLC) e.g. mmWave V2X. To realize such requirements, it is essential to combine mmWave with Mobile Edge Computing (MEC), a technology allocating storage and computation resources at the edge of the network to reduce latency. However, how to combine them effectively has not been fully discussed, especially for critical applications of strict latency constraints foreseen in 5G networks. Another critical issue in terms of cost is how to backhauling the mmWave smallcell networks, knowing that it is impossible to provide Gigabit Ethernet backhaul everywhere. One of the solution is to introduce self-backhauling technique using mmWave in combination with Software Defined Network (SDN) technology to reduce OPEX/CAPEX. However, detailed discussions e.g. interference management or implementation issues should be investigated thoroughly in practice. The main objective of the workshop is to offer an opportunity for academic and industrial researchers to discuss on evolutional technologies and killer ecosystems for the realization of 5G Phase II, taking into account the combination of mmWave and MEC, under the support of MEC/SDN technologies.

4. Summary of WDN-5G ICC2018

WDN-5G was held at Sheraton Kansas City Hotel, on the first day of ICC2018, one of the flagship conferences of IEEE ComSoc. The conference venue is located in the heart of the Crown Center complex, which is the center of the city for shopping, dining and entertainment destinations like the SEA LIFE Kansas City Aquarium and LEGOLAND® Discovery Center. This full-day workshop was separated into AM and PM sessions with two keynote speeches respectively, 18 accepted papers after rigorous review from experts of the field. Especially, seven papers among the technical papers were presented in an interactive style. The program of the workshop is presented in Table 1.

In the opening, the organizing chair of the workshop briefly explained the scope of WDN-5G and introduced the full-day workshop's program. After the introduction, the first keynote speech with title "SPECTRUM SHARING AND NETWORKING ISSUES IN 5G MMWAVE CELLULAR NETWORKS" was delivered

by Prof. Michele Zorzi, who is a professor at the Information Engineering Department of the University of Padova (Italy). He is currently the founding Editor-in-Chief of IEEE Transactions on Cognitive Communications and Networking and also a Fellow of the IEEE. In the invited talk, the keynote speaker discussed some relevant networking issues for 5G mmWave cellular systems. In the first half of the talk, he gave an extensive discussion on the potential benefits and technical challenges of spectrum sharing in a mmWave context. The speaker emphasized that this scenario is much more promising than traditional cellular systems in sub-6 GHz bands. He also discussed the role of coordination between different operators for the purpose of managing the inter- and intra-system interference, which is shown to be the ultimate limiting factor in spectrum sharing. In the second half of the talk, Prof. Michele Zorzi discussed how directionality makes it more difficult to implement and operate network management functionalities, with specific reference to Initial Access and Cell Search, where the energy/latency/detection tradeoff is of particular interest. At the end of the talk, the invited speaker briefly described his team's developed full-stack 5G mmWave cellular simulator, which includes the whole protocol suite as well as detailed mmWave channel models, and presented some examples of system-level results the simulator can provide.

Table 1 The program of WDN-5G 2018

08:30 -10:15	W07-S1 WDN5G: Keynote AM (Prof. Michele Zorzi) and Technical Paper Session (Beamforming)
11:00 -12:30	W07-S2 WDN5G: Paper Session (Resource Management)
14:00 -15:30	W07-S3 WDN5G: Keynote PM (Prof. Kei Sakaguchi) and Technical Paper Session (Antenna & Propagation)
15:30 -16:30	W07-S-I WDN5G: Interactive Session

The second keynote speech was delivered at the beginning of PM session after the lunch break. The talk with title “COOPERATIVE PERCEPTION REALIZED BY MILLIMETER-WAVE V2V2X FOR AUTOMATED DRIVING” was presented by Prof. Kei Sakaguchi, one of the general co-chairs of the WDN workshop series. The speaker is currently a professor at Tokyo Institute of Technology (Japan) and also a scientific consultant at Fraunhofer HHI (Germany). He had received many awards from IEICE CS, e.g. three Best Paper Awards in 2012, 2013, and 2015, and also served as the Chair of Technical Committee on Smart Radio in the past. The talk focused on automated driving, which is considered as one of three largest applications in 5G cellular networks. The speaker

explained that there are two types of automated (or autonomous) driving. One is egoistic type using only self-mounted sensors, and the other is cooperative type using extended sensors mounted on RSUs (Road Side Units) and other vehicles. The speaker pointed out that the cooperative type (cooperative perception) is effective in complex urban environments to solve problems of blocking due to surrounding vehicles and buildings. For that purpose, Prof. Kei Sakaguchi proposed an extended system architecture for 5G cellular networks to realize such cooperative perception. The important elements in the extended system architecture are millimeter-wave (mmWave) V2V2X (Vehicle-to-Vehicle-to-Everything Relay) and MEC (Mobile (Multi-access) Edge Computing). The mmWave V2V2X is used to realize ultra-high data rate communication among vehicles and RSUs to exchange sensing data of e.g. LiDAR (Light Detection and Ranging), and the MEC is used for fusion of dynamic maps measured by extended sensors. To validate the proposed system's effectiveness, the speaker evaluated safeness of automated driving by considering a scenario of overtaking vehicle by changing vehicular velocity and data rate of sensing data (LiDAR).

For the general oral sessions, 18 accepted papers are categorized into 4 sessions from different perspectives i.e. antenna & propagation, beamforming, resource management. Especially, seven papers were selected from the accepted papers to be presented in Interactive Session, where presenters were provided with HD displays and conducted presentations with audiences in an interactive manner. This session had highest number of participants compared to the other oral ones. The list of the papers in this session is summarized below:

- (1) Architecture of mmWave edge cloud in 5G-MiEdge (invited paper from 5G-MiEdge)
- (2) Handover Prediction based on Geometry method in mmWave Communications --- A Sensing Approach (The University of Tennessee, USA, etc.)
- (3) Increasing the Reliability of Smart Metering System Using Millimeter Wave Technology (University of Idaho, USA)
- (4) Paired Listen Before Talk for multi-RAT Coexistence in Unlicensed mmWave Bands (CTTC, Spain, etc.)
- (5) Partially Blind Handovers for mmWave New Radio Aided by Sub-6 GHz LTE Signaling (The University of Texas at Austin, USA)
- (6) Use cases, requirements and challenges of 5G communication for industrial automation (Huawei Technologies, Germany)
- (7) Sparse Channel Estimation in Millimeter-Wave Communications via Parameter Perturbed OMP (The University of Alabama, USA, etc.)

Other papers and slides of keynote speakers can be found on the workshop website [1].

5. References

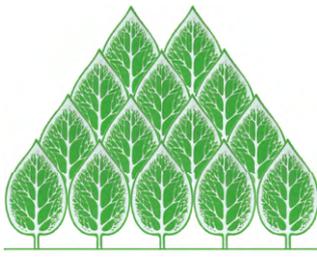
- [1] <http://icc2018.ieee-icc.org/workshops>
- [2] <http://5g-miedge.eu/>

IEICE-CS Related Conferences Calendar

Date	Conference Name	Location	Note
28 July – 2 Aug. 2019	IEEE International Geoscience and Remote Sensing Symposium 2019 (IGARSS 2019)	Yokohama, Japan	TBD
7 July – 11 July 2019	The 24 th Opto-Electronics and Communications Conference / International Conference on Photonics in Switching and Computing 2019 (OECC / PSC2019)	Fukuoka, Japan	Submission due: 28 February 2019
3 June – 7 June 2019	2019 Joint International Symposium on Electromagnetic Compatibility and Asia-Pacific International Symposium on Electromagnetic Compatibility, Sapporo (EMC Sapporo & APEMC 2019)	Sapporo, Japan	Submission due: 24 December 2018
20 May – 23 May 2019	International Conference on DC Microgrids (ICDCM2019)	Matsue, Japan	Submission due: 10 October 2018
8 April – 10 April 2019	The 14 th International Symposium on Autonomous Decentralized Systems (ISADS2019)	Utrecht, Netherlands	Submission due: 1 October 2018
12 Nov. – 14 Nov. 2018	The 24 th Asia-Pacific Conference on Communications (APCC2018)	Ningbo, China	To be held soon
6 Nov. – 9 Nov. 2018	2018 Asia-Pacific Microwave Conference (APMC 2018)	Kyoto, Japan	To be held soon
23 Oct. – 26 Oct. 2018	2018 International Symposium on Antennas and Propagation (ISAP2018)	Busan, Korea	To be held soon
22 Oct. – 24 Oct. 2018	2018 IEEE 7 th International Conference on Cloud Networking (CloudNet2018)	Tokyo, Japan	To be held soon
17 Oct. – 19 Oct. 2018	International Conference on Information and Communication Technology Convergence 2018 (ICTC2018)	Jeju Island, Korea	To be held soon
14 Oct. – 17 Oct. 2018	International Conference on Renewable Energy Research and Applications (ICRERA2018)	Paris, France	To be held soon
19 Sep. – 20 Sep. 2018	Topics on Secure Architectures (TOSAR 2018)	Iasi, Romania	To be held soon
29 Aug. – 31 Aug. 2018	2018 IEEE International Workshop on Electromagnetics: Applications and Student Innovation Competition (iWEM 2018)	Nagoya, Japan	Done
11 July – 13 July 2018	2018 IEICE Information and Communication Technology Forum (2018 IEICE ICTF)	Graz, Austria	Done
9 July – 11 July 2018	IEEE Photonics Society 2018 Summer Topicals Meeting Series (IEEE Summer Topicals 2018)	Hawaii, USA	Done
4 July – 7 July 2018	The 10 th International Conference on Ubiquitous and Future Networks (ICUFN 2018)	Prague, Czech Republic	Done
2 July – 6 July 2018	The 23 rd Opto-Electronics and Communications Conference (OECC 2018)	Jeju Island, Korea	Done
3 June 2018	Technology Trials and Proof-of-Concept Activities for 5G and Beyond 2018 (TPoC5G 2018)	Porto, Portugal	Reported on this issue
20 May 2018	The 11 th International Workshop on Evolutional Technologies & Ecosystems for 5G Phase II (WDN-5G ICC2018)	Kansas City, USA	Reported on this issue

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

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



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Scope

Opportunities and challenges for implementing highly complex, efficient, and dependable business and control systems have been steadily increasing, driven by the continuous growth in the power, intelligence, adaptiveness and openness of technologies and standards applied in computing, communication and control systems. Dynamically changing social and economic situations demand the next-generation of systems to be based on adaptive, reusable, and internet and Web-enabled technologies and applications. Such systems are expected to have the characteristics of living systems composed of largely autonomous and decentralized components. Such systems are called Autonomous Decentralized Systems (ADS). The International Symposium on Autonomous Decentralized Systems (ISADS) has been the premier events in the past twenty-eight years to have successfully addressed these challenges. The 14th ISADS 2019 will continue to focus on the advancements and innovations in ADS concepts, technologies, applications strategic issues, and other related topics. The special topic for ISADS 2019 is "Technology and Business Innovation through Structure Change of Society and Life". We invite research papers, workshop proposals, panel proposals, and student papers on, but not limited to, the following topics:

- Internet of Things, cyber-physical systems, reactive systems, distributed embedded systems
- Industry 4.0, and autonomous robotics and transportation
- Ad-hoc networks, sensor networks, advanced network infrastructures and internetworking
- Architecture-driven and model-driven development of distributed applications
- Assurance, fault tolerance, on-line expansion, on-line-maintenance, and resilience
- Autonomous and decentralized services, including service architecture, protocols, and collaboration
- Cloud computing and big data analysis
- Distributed and collaborative development, test and maintenance, and development infrastructure of high-quality software systems, cloud computing, and service-oriented architecture
- Heterogeneous distributed information / control systems, mobile agent / computer-supported cooperative works
- Modelling and simulation of autonomous services and service-oriented application composition
- Network and system security and safety
- Autonomous Decentralized System Applications in smart grids
- Autonomous Decentralized System Applications in railway engineering
- Novel applications, including e-business, e-commerce and e-government; telecommunications; information service systems; manufacturing systems; real-time event management; office automation; traffic and transportation control; supply chains; environmental/emergency protection; networked health and medical systems; intelligent home control; embedded systems for automotive and avionics applications

Information for Authors

Papers should describe original work and be of 6 to 8 pages in IEEE double-column conference paper format. Workshop paper should be of length 5 to 6 pages. Papers should include: title, authors, affiliations, 150-word abstract and list of keywords. Please identify the contact author clearly, including name, position, mailing address, telephone and fax numbers, and email address. At least one of the authors of each accepted paper must register and present the paper at ISADS 2019. Authors must submit their manuscripts electronically following the instructions at the ISADS 2019 web site at: <http://www.isads2019.org>

Information for Workshop and Panel Organizers

Workshop and panel proposals should include: title, organizer affiliation, position, mailing address, telephone and fax numbers, email address, and a draft call-for-papers, including Chairs, committees and submission deadline. Workshop and Panel proposals must be e-mailed to the program chair, Dr. Leo van Moergestel (leo.vanmoergestel@hu.nl)

Important Dates

June 30, 2018: Workshop proposals are due.

October 1, 2018: All papers and panel proposals are due.

November 15, 2018: Authors and panel organizers notified of acceptance.

December 31, 2018: Camera-ready copies of accepted papers and panellist position papers.

General Information

For general information, visit the ISADS 2019 web site at: <http://www.isads2019.org> or email the program chair, Dr. Leo van Moergestel (leo.vanmoergestel@hu.nl).



Matsue castle,
A national Treasure of Japan



The 3rd IEEE International Conference on DC Microgrids (ICDCM)

May 20-23, 2019, Kunibiki-messe, Matsue, Japan

The International Conference on DC Microgrids (ICDCM) aims to bring together professionals from industry and researchers in the field of DC microgrids and related technologies to advance understanding and capability for endpoint use of DC systems and technologies. The 3rd ICDCM will take place in a historical and beautiful city, Matsue, Japan, May 20-23, 2019 subsequent to the successful 2nd conference held in Nürnberg, Germany, 2017.

Technical sessions will be arranged around focus areas – the use of DC systems with low voltages (up to 1500 VDC) in kW power scale e.g. in residential and commercial applications and MW power scale in industrial applications as a part of private or public installations with up to several thousand Volts. The conference will include oral presentations, poster sessions, plenary sessions, educational tutorials, vendor shows, excursions, and social programs.

Important dates

- Deadline for digests: October 15, 2018
- Notification of acceptance/rejection: December 7, 2018
- Deadline for accepted full papers: February 28, 2019

Scope of topics

Papers are solicited especially on the following topics (but not limited):

- DC Microgrids for transportation electrification
- Powering residential, commercial, and industrial spaces
- DC distribution grids and DC flexible links
- Integration of distributed energy resources and storage systems
- Standards and policies
- DC protection and safety
- Reliability and resiliency
- DC-powered PHEV/EV interconnections of EV with DC Microgrids
- Stability, performance analysis and optimization
- Power control and routing
- Energy exchange and ancillary services
- DC-powered equipment and appliances
- Components and devices for DC systems
- Active and passive smart solar houses using DC
- ICT, Real-time monitoring and control
- Total Cost of Ownership (TCO) and, life-cycle economics comparison of AC and DC power systems

Committee members

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Contact

Additional information is available at:
<https://power.aitech.ac.jp/ICDCM2019/>
 Further questions or requests can be mail to:
icdcm2019@aitech.ac.jp

EMC Sapporo & APEMC 2019

2019 Joint International Symposium on Electromagnetic Compatibility and
Asia-Pacific International Symposium on Electromagnetic Compatibility, Sapporo

Sapporo Convention Center, Sapporo, Japan
June 3 -7, 2019
- After five years of EMC'14/Tokyo -

Organized Session Proposal Deadline: October 26, 2018

Paper Submission Deadline: December 24, 2018

<http://www.ieice.org/~emc2019/>



First
Call for Papers

OECC/PSC 2019

24th Optoelectronics and Communications Conference/
International Conference on Photonics in Switching and Computing 2019

July 7-11, 2019
Fukuoka, Japan



Fukuoka International Congress Center, Fukuoka, Japan

<http://oeccpsc2019.org>

Paper Submission Deadline: February 28, 2019

Sponsored by:



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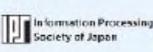


IEEE Photonics Society



OSA(The Optical Society)

In corporation with:



IEEE Communications Society Tokyo/FK/HR/NG/SP/SK/SE Joint Chapter

WELCOME MESSAGE

OECC

It is our great pleasure to welcome you to the 24th Optoelectronics and Communications Conference (OECC 2019) which will be held from July 7th to 11th 2019 at Fukuoka International Congress Center, Fukuoka, Japan. OECC is one of the foremost international conferences held annually in the Asia-Pacific region for the researchers and engineers working in the fields of optoelectronics, optical fiber transmission, and photonic network systems. It has been providing the best international forum to present and discuss the progress in research and development of these areas.

In addition, OECC 2019 is planning to be held jointly with Photonics in Switching and Computing (PSC) at Fukuoka, a city of a gateway of Japan to Asia from ancient times. We believe that this joint conference attracts a lot of related engineers and researchers for most of the opto-electronics and communication field.

On behalf of the organizing committee, we would like to express our hearty welcome to all of you who are participating in OECC 2019, and hope you all will have a pleasant stay and experience in Fukuoka.

SCOPE

OECC

01. Core/Access/Data Center Networks and Subsystems
02. Transmission Systems and Subsystems
03. Optical Fibers, Cables and Fiber Devices
04. Optical Active Devices and Modules
05. Optical Passive Devices and Modules

PSC

- P1. Photonics in Switching Technologies, Systems, and Architectures for Communications and Networking
- P2. Photonics in Switching Technologies, Systems, and Architectures for Computing and Big Data

PAPER SUBMISSION GUIDELINES

Authors are requested to submit the paper electronically through the online submission interface no later than **February 28, 2019**.

- The paper submission procedure will be managed via online paper submission system.
- Each author is requested to submit a **35-word abstract** and a **three page-long summary** in PDF file (single space with single columned).
- Copyright form must be submitted together with the paper. Copyright form is provided as part of your submission in our online submission system.

NOTE: Authors must create a PDF file according to the IEEE PDF Specification for IEEE Xplore. All submissions MUST be IEEE Xplore compliant and the best way to insure this is to use IEEE PDF express. (<http://www.pdf-express.org/>)

Important Date:

Paper Submission starts December 2018
Paper Submission due date February 28, 2019 (JST, UTC+9)
Acceptance Notification End of April, 2019
Post Deadline Paper (PDP)
Submission due date June 21, 2019
PDP Acceptance Notification July 7, 2019

For more details, please visit our website:
<http://oeccpsc2019.org>

PSC

The Photonic in Switching and Computing (PSC) conference welcomes you to Fukuoka, Japan in July 2019. PSC is a unique conference which addresses all aspects of optical networks including: i) optical systems and subsystems, ii) optical components and devices, and iii) network control and management for telecom, datacom, high performance computing (HPC), and big data. The main focus is on optical switching technologies for networking and computing systems with emphasis on vertical integration from technologies to systems and architectures. Some of latest research in PSC areas will be presented in a stimulating environment with in-depth and open discussions of the latest trends in this area.

PSC is the successor of the well-known Photonics in Switching (PS) conference which has been running annually since 2001 alternating location between North America, Europe and Asia. PSC 2019 is the second conference edition, explicitly integrating emerging computing topics. PSC 2019 will be jointly held with OECC. We strongly believe that this joint conference will provide attendees with a great opportunity to explore the wide spectrum of research topics spanning from device to networking technology and their integration. We encourage all of you to submit your up-to-date research results to PSC 2019.

See you in Fukuoka.

Special Section Calendar of IEICE Transactions on Communications

Issue	Special Section	Note
Jan. 2020	Internet Architecture, Applications and Operation Technologies for a Cyber-Physical System	Submission due: 15 February 2019 See page 35
Oct. 2019	Exploring Drone for Mobile Sensing, Coverage and Communications: Theory and Applications	Submission due: 10 November 2018 See page 34
Sep. 2019	Enhancing Information Centric Networking Technologies Towards Real-world Infrastructure	Submission due: 5 October 2018 See page 33
Aug. 2019	Technology Trials and Proof-of-Concept Activities for 5G and Beyond	Submission due: 7 September 2018 See page 32
Jul. 2019	Communication Technologies and Service Qualities in Various Access Networks	To be issued
Jun. 2019	Healthcare, Medical Information and Communication Technology for Safe and Secure Society	To be issued
May 2019	European ICT R&D Project Activities on Broadband Access Technologies in Conjunction with Main Topics of 2016/2017 IEICE ICT	To be issued
Apr. 2019	Sensing, Wireless Networking, Data Collection, Analysis and Processing Technologies for Ambient Intelligence with Internet of Things	To be issued
Mar. 2019	Network Virtualization and Network Softwarization for Diverse 5G Services	To be issued
Feb. 2019	Recent Progress in Antennas and Propagation in Conjunction with Main Topics of ISAP2017	To be issued
Jan. 2019	No special section this issue	
Dec. 2018	No special section this issue	
Nov. 2018	No special section this issue	
Oct. 2018	Wireless Distributed Networks for IoT Era	To be issued soon
Sep. 2018	No special section this issue	
Aug. 2018	Autonomous Decentralized Systems Technologies and Approaches Innovation through Structure Change of Society and Life	Vol. E101-B, No. 8
Jul. 2018	Communication Quality in Wireless Networks	Vol. E101-B, No. 7

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

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

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

1. Scope

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

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

2. Submission Instructions

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

This special section will accept papers only by electronic submission. Submit a manuscript and electronic source files (LaTeX/Word files, figures, authors' photos and biographies) via the IEICE Web site https://review.ieice.org/regist/regist_baseinfo_e.aspx by **7th September 2018 (JST)**. Authors should choose the "Technology Trials and Proof-of-Concept Activities for 5G and Beyond" as a "Journal/Section" on the online screen. **Do not choose [Regular EB]**.

Contact point:

Shinsuke Ibi

Osaka University

Tel: +81 6 6879 7738, Email: rcs_ac-eb-tpoc5g-chair@mail.ieice.org

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----- Special Section on Enhancing Information Centric Networking Technologies Towards Real-world Infrastructure -----

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Special Section on Enhancing Information Centric Networking Technologies Towards Real-world Infrastructure " in the September 2019 issue.

As a future Internet technology, researches on Information Centric Networking (ICN) are being active globally, which uses information or content itself as an identifier of communication instead of IP addresses. Currently most of research and development on ICN are considered as an individual exploratory research, however, it is expected to promote R&D activities to shift toward future real-world ICN infrastructure. In this respect, approaches are required from interdisciplinary research fields including applications and use cases, large scale experiments, deployment, operations, and management. Therefore, a special section is being planned (scheduled to appear in the September 2019 issue) to further promote research and development of ICN for future networks.

1. Scope

This special issue aims to identify emerging research topics regarding Information Centric Networking. The topics covered by this special issue include, but not limited to, the following topics. Also, closely related topics such as content-based networks including CDN (Content Delivery Network), content-based dissemination, and/or contents acquisition are welcome.

- **Information-Centric Networking Applications**
M2M, IoT, Home Networks, Sensor Networks, Cyber Physical Systems, Testbeds
- **Information-Centric Networking Architecture**
Information-Centric Networking Architecture Design, Content-based Routing, In-network Caching, Autonomous Distributed System, Edge/Fog Computing, Cloud, Energy Aware Networks, Pub/Sub
- **Information-Centric Networking Principles**
Content-based Measurement and Analysis, Content Provisioning, BigData Processing, Social Network Analysis, Network Performance Evaluation, Modeling Information-Centric Networks
- **Information-Centric Networking Substrate Technologies**
Name Resolution Protocols, Packet Processing, Node Architecture, Content Mobility, Content Access Controls, Privacy and Security, ID/Locator Separation, Transport Techniques, Flow Controls

2. Submission Instructions

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

This special section will accept papers only by electronic submission. Submit a manuscript and electronic source files (LaTeX/Word files, figures, authors' photos and biographies) via the IEICE Web site https://review.ieice.org/regist/regist_baseinfo_e.aspx by **October 5, 2018 (JST)**. Authors should choose the Enhancing Information Centric Networking Technologies Towards Real-world Infrastructure as a "Journal/Section" on the online screen. Do not choose [Regular EB].

Contact point:
Tomohiko Yagyu
NEC Corporation
Tel: +81-44-396-3419, E-mail: eb-icn2019@mail.ieice.org

3. Special Section Editorial Committee

Guest Editor-in-Chief: Shingo Ata (Osaka City Univ.)

Guest Editors: Tomohiko Yagyu (NEC), Yuichi Ohshita (Osaka Univ.)

Guest Associate Editors: Keisuke Ishibashi (NTT), Fumio Teraoka (Keio Univ.), Noriaki Kamiyama (Fukuoka Univ.), Yuki Koizumi (Osaka Univ.), Chikara Ohta (Kobe Univ.), Hiroaki Harai (NICT)

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* Please note that if the submitted paper is accepted, all authors, including authors of invited papers, are requested to pay for the page charges covering partial cost of publications.

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

* The accepted papers will be published online soon after notification of acceptance on the web site of Transactions Online. For detailed information, please visit http://www.ieice.org/eng/shiori/page2_cs.html#8

----- Special Section on Exploring Drone for Mobile Sensing, Coverage and Communications: Theory and Applications -----

The IEICE Transactions on Communications announces that it will publish a special section on "Exploring Drone for Mobile Sensing, Coverage and Communications: Theory and Applications" in the **October 2019** issue.

Nowadays drone system has emerged as an advanced technology with boundless viable applications due to its on-demand deployment, fast response, low cost and flexibility in reconfiguration and movement, such as reconnaissance, cargo delivery, agriculture, photography and other public services. Specifically, the use of drone system for achieving high-speed and prompting wireless communication would interact with underlying sensing network and thus enhance the total network efficiency. It is expected that the drone system has a huge growth prospect, and extensively exploring drone system would transform traditional application scenarios and network topologies accordingly which arouses much distinctive attention including weak connectivity maintenance, energy management, reliable data transfer, data fusion, motion control and scheduling, etc. Indeed, drone-based applications are to extend conventional functions, provide services and results which are fundamentally different from previous studies. To meet such demands, it is important to build technologies for efficient and reliable mobile sensing, coverage and communication in drone system.

1. Scope

The special section aims at timely dissemination of research. Possible topics include, but are not limited to:

- Drone communication
- QoS and performance for drone-aided ubiquitous sensing coverage
- Multi-hop wireless communication and Drone-enabled mobile relaying
- Amateur drone detection and tracking
- Mobile charging, tour planning and routing protocols for drones
- Efficient aerial information dissemination/data collection
- Cooperative motion control of drones flying in formation
- Task distribution and resource allocation for heterogeneous drone system
- Drone-based data fusion and trustworthy services

2. Submission Instructions

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

The special section accepts papers only by electronic submission. Submit a manuscript and source files (LaTeX/Word files, figures, authors' photos and biographies) via IEICE Web site https://review.ieice.org/regist/regist_baseinfo_e.aspx **by November 10, 2018 (JST)**. Authors should choose the Exploring Drone for Mobile Sensing, Coverage and Communication: Theory and Applications as a "Journal/Section" on the online screen. Do not choose [Regular EB].

Contact point:

Ruidong Li, National Institute of Information and Communications Technology
Tel: 042-327-5813, E-mail: eb-drone@mail.ieice.org

3. Special Section Editorial Committee

Guest Editor-in-Chief: Panlong Yang (University of Science and Technology of China, China)

Guest Editors: Takefumi Hiraguri (Nippon Institute of Technology, Japan), Ruidong Li (NICT, Japan), Zhi Liu (Shizuoka University, Japan),

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* Upon accepted for publication, all authors, including authors of invited papers, should pay the page charges covering the partial cost of publication around March 2019. For detailed information, please visit http://www.ieice.org/eng/shiori/page2_cs.html#5

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* The accepted papers will be published online soon after notification of acceptance on the web site of Transactions Online. For detailed information, please visit http://www.ieice.org/eng/shiori/page2_cs.html#8

----- **Special Section on Internet Architecture, Applications and Operation Technologies
for a Cyber-Physical System** -----

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Internet Architecture, Applications and Operation Technologies for a Cyber-Physical System" in the **January 2020** issue.

The Internet has become an important social infrastructure which underpins human activities, it is now widely integrated into society as a part of our lives. In the future, data will be generated from all kinds of places, people, things, and various data distribution and utilization will be further accelerated.

Establishing a "cyber-physical system" which creates new value for society will become increasingly important by collecting various data in the real (physical) world with the sensor network or the Internet and analyzing and knowledge using large-scale and distributed data processing technology. To deploy the cyber-physical system widely in society, it is important to establish multilateral solutions including not only the design of the Internet architectures and protocols but also the contributions against security issue between the real world and cyberspace. Platform technologies that enable to collect, storage and analysis various data using distributed computing, cloud edge computing, etc. are also indispensable. The network management and operation technologies should be sophisticated to feedback the analysis results obtained by these platforms from cyberspace to the real world. Because of such reasons, we call for publications (scheduled to appear in the January 2020 issue) to further promote research and development of Internet architecture, applications and operation technologies for a cyber-physical system.

1. Scope

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

- * Architectures and protocols for the CPS(Cyber-Physical System) / IoT(Internet of Things)
 - routing and traffic control technologies for large and complex networks
 - software-defined networking, network function virtualization, information centric networking, delay tolerant networking
 - sensor network, vehicular network, data center network
 - network security
- * Platform technologies for the CPS(Cyber-Physical System) / IoT(Internet of Things)
 - distributed computing, grid computing, cloud computing, edge computing, inter-cloud technologies
 - bigdata/social data analysis platform, test bed system
 - M2M network, P2P network
- * New applications in cyber physical society
 - IoT applications, bigdata analysis applications, simulation, embedded applications, applications of artificial intelligence
 - case studies involving implementations and experiments adapted to cyber physical society
- * Network management and operation technologies / experiences to accelerate the CPS
 - IoT device management methods
 - QoS/QoE support mechanisms, management methods for huge devices, access control technologies
 - security technologies, e.g., authentication, authorization and accounting mechanisms, intrusion detection

2. Submission Instructions

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

This special section will accept papers only by electronic submission. Submit a manuscript and electronic source files (LaTeX/Word files, figures, authors' photos and biographies) via the IEICE Web site https://review.ieice.org/regist/regist_baseinfo_e.aspx by February 15, 2019(JST). Authors should choose the **Internet Architecture, Applications and Operation Technologies for a Cyber-Physical System** as a "Journal/Section" on the online screen. Do not choose [Regular EB].

Contact point:

Yoshiaki Kitaguchi

Tokyo Institute of Technology

Tel: +81-03-5734-3354, Fax: +81-5734-3276, E-mail: eb-ia2020@mail.ieice.org

3. Special Section Editorial Committee

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Guest Editors: Yoshiaki Kitaguchi (Tokyo Inst. of Tech.), Ryohei Banno (Tokyo Inst. of Tech.)

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

● IEICE Societies and Publications

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

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Basic Membership Charge (UNIT : Japanese YEN)

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		Registration of the first society (includes its online version transactions)	Registration of additional societies (includes its online version transactions)	Journal (written in Japanese)
Member (overseas)	1,400	7,000	3,500 / 1society	6,000
Member (overseas) with OMDP*	1,000	5,000	3,000 / 1society	6,000
Student member (overseas)	-	2,000	2,000 / 1society	6,000
Student member (overseas) with OMDP*	-	1,000	1,500 / 1society	6,000

NOTE

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

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

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

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

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

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

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

● Optional Rapid Mailing Service

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

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

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

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

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

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

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

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

Sister Society membership information

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

Sister Society: IEEE ComSoc KICS VDE-ITG

Membership number (Member): _____

Copy of Membership certificate or Membership card:

(Attached here)

IEICE Communications Society - GLOBAL NEWSLETTER

Submission Guideline

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

1. About GLOBAL NEWSLETTER

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

1.1. Goal

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

1.2 Category of Articles

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

2. Major notes for Contribution

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

2.1 Template and Language

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

2.2 Number of pages

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

3. Copyright

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

should register the action with the IEICE, and the original manuscript should be clearly cited in the publications. Please see a web site related to IEICE provisions on copyright.

<http://www.ieice.org/eng/copyright/index.html>

4. Publication fee / Manuscript fee

No publication fee and no manuscript fee for all articles.

5. Schedule

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

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

5.1 Call for Newsletters

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

5.2 Contribution Entry

You should send **information on title, summary(around 50 words or less) and number of page** to IEICE-CS Directors, Planning and Members Activities by e-mail.

E-mail: cs-gnl@mail.ieice.org

5.3 Submission of Manuscript

You should send a manuscript both in word file and pdf file to IEICE-CS Directors, Planning and Members Activities by e-mail.

E-mail: cs-gnl@mail.ieice.org

5.4 Submission of COPYRIGHT TRANSFER FORM

COPYRIGHT TRANSFER FORM can be downloaded at:

http://www.ieice.org/cs/pub/global_howto.html

Signed **COPYRIGHT TRANSFER FORM** should be sent by one of the following ways:

- By email.
- By facsimile.

Address to send:

- In case of email: cs-gnl@mail.ieice.org
- In case of facsimile:

Name: Publications Department, IEICE

Facsimile: +81-3-3433-6616, Phone: +81-3-3433-6692

6 Contact Point

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

From Editor's Desk

● A New Member of Editorial Staff Joined

A new member joined the editorial staff in June this year and has been engaged in publication operations from this issue. Through the publication of GLOBAL NEWSLETTER (GNL), we are continuously trying to share information between overseas/foreign members and other members in IEICE-CS. We welcome your contribution of article submissions to GNL. For article submission, please refer to the Submission Guideline of IEICE-CS GLOBAL NEWSLETTER:

[ENG] http://www.ieice.org/cs/pub/global_howto.html

[JPN] http://www.ieice.org/cs/jpn/pub/global_howto.html

● IEICE Society Conference 2018 Held in Kanazawa

IEICE Society Conference 2018 will be held at Kanazawa University, Kanazawa, from 11th to 14th September 2018. Complete English sessions are also scheduled in the conference. Please check out the latest conference information on the IEICE web site at:

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

IEICE-CS GLOBAL NEWSLETTER Editorial Staff

Editorial Staff of this issue

No special order is observed.



Yoshitaka ENOMOTO

Nippon Telegraph and Telephone Corporation
Access Network Service Systems Laboratories

Director, Planning and Member Activities, IEICE Communications Society



Yohei KOGA

Fujitsu Laboratories, Ltd.
IoT Systems Laboratory

Director, Planning and Member Activities, IEICE Communications Society



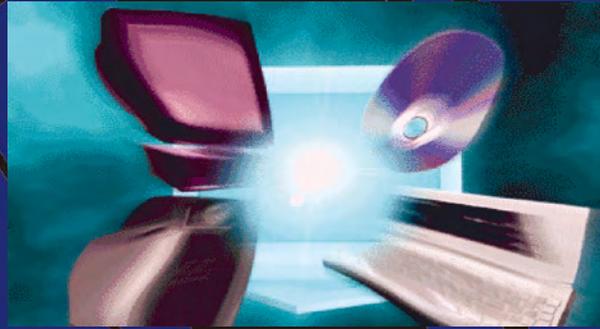
Manabu KAI

Fujitsu Laboratories, Ltd.
IoT Systems Laboratory

Director, International Publication, IEICE Communications Society

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

IEICE Communications Society



IEICE Society Conference 2018

11–14 September 2018

Kanazawa University Kakuma Campus, Kanazawa

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

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

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

Kikai-Shinko-Kaikan Bldg.,5-8, Shiba-Koen, 3, Minato-ku, Tokyo, 105-0011, JAPAN

Web: <http://www.ieice.org> TEL: +81-3-3433-6691 FAX: +81-3-3433-6659

IEICE Communications Society: cs-secretariat@ieice.org