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# Research of Guidance and Control System for a Small-scale Supersonic UAV

–Practical education through research project–

Masazumi Ueba

Muroran Institute of Technology



## 1. Introduction

At present time, in cooperation with the Aerospace Plane Research Center (APReC) in our institute, I am engaged in research and development of Guidance and Control technologies for supersonic unmanned air vehicle (UAV). The APReC has promoted research project on the aerospace-plane as a platform upon to advance the field of aerospace engineering technologies. Those technologies are going to be verified by using a small-scale supersonic UAV called “Oowashi II” as a flying test bed.

In the field of Guidance and Control technologies, a lot of designs and outdoor experiments are required not only for Oowashi II but also for its prototype airplanes. Both undergraduate and graduate students in our laboratories face practical experiences through the project.

In this letter, my research activities together with status of education of our students are introduced.

## 2. Supersonic UAV

There are many UAVs operating in the world. Those UAVs are summarized as shown in Fig. 1 with weight and speed as parameters. The graph shows that the smaller UAVs fly at low speed, the bigger UAVs fly at high speed. So to realize a small-scale supersonic UAV is challenging.

Oowashi II is designed to weigh about 300 kg and is planned to fly over Pacific Ocean eastward to the distance of 100 km as shown in Fig. 2 and reach the speed of Mach 2. This means a small-scale UAV fly at the supersonic speed.

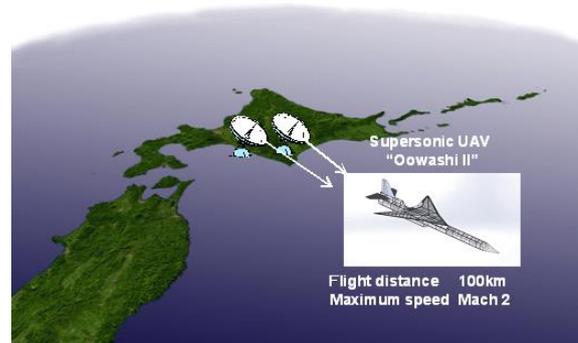


Fig. 2 Supersonic UAV “Oowashi II” as Flying Test Bed

## 3. Research of GNC and TTC

Generally to fly an unmanned air vehicle autonomously requires to be equipped with two subsystems. One is a Guidance, Navigation and Control subsystem called GNC and the other is a Telemetry and Command subsystem called TT&C as shown in Fig. 3.

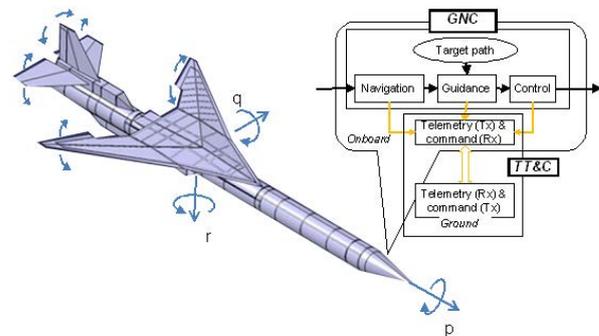


Fig. 3 Diagram of GNC and TT&C subsystem

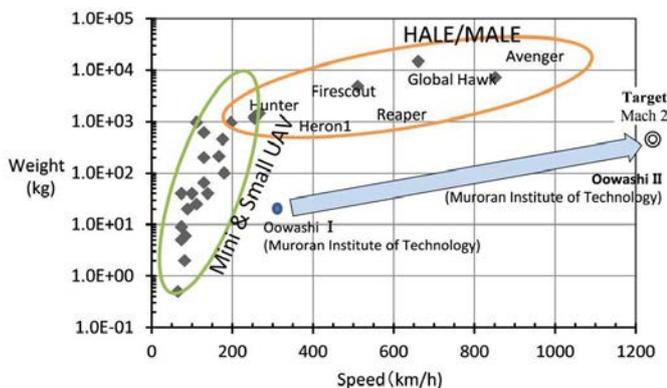


Fig. 1 UAV in the world

GNC subsystem keeps its flight path, velocity and attitude within the designated ones determined by each flight mode. TT&C monitors its flight status as well as the vehicle conditions and transmits them as telemetry data from the vehicle to the ground. Depending on their results, some adequate commands are transmitted from the ground to the vehicle to change flight mode or cope with an emergency. Those telemetry and command data are transmitted by using wireless communication system. The GNC and TT&C subsystem for Oowashi II are now under construction as shown in Fig. 4 while their performances and functions are partially verified by experiments using model airplanes. GNC and

TT&C are mainly constituted by two microprocessor board with one dedicated to the GNC of the vehicle and the other dedicated to collection of flight and status data by TT&C. As for telemetry data transmission in TT&C subsystem, a license of the experimental radio station was given in 1.2 GHz frequency bands. The telemetry Tx equipment can transmit data up to the 100 km distance at the speed of 128 kbps.

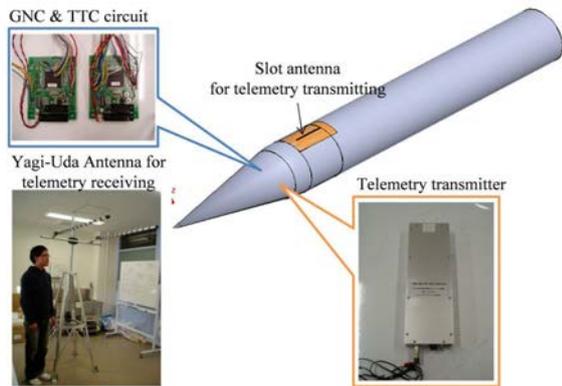


Fig. 4 GNC and TT&C circuit and wireless communication equipment for telemetry data

#### 4. Education through research project

In parallel with research and development of GNC and TT&C subsystems onboard Oowashi II, those subsystems are also constituted on market model airplanes. The same sensors, Inertial Navigation System, Air Data Sensor and Altimeter, as those onboard Oowashi are used from the beginning. Control laws are implemented on microprocessor board which is easily available on market and of which Software Development KIT is available with free of charge. By using them, both undergraduate and graduate students learn to design and implement control laws by using hardware as shown in Fig. 5. Actuators are servomotors generally used for model airplanes. However, for Oowashi II, depending on required performance, trial products may be required to be made.

Wireless communication system is the important part of TT&C subsystem. At present time, the airplane flies at the distance of 500 m, therefore, 2.4 GHz wireless communication module called XBee Pro S1 is used.



Fig. 5 Implementation of control law on GNC circuit onboard model airplanes

The flight test is carried out at Shiraoi runway in Shiraoi-cho (Fig. 6(a)). The length of the runway is 800 m and is enough for the early stage of autonomous flight. There are little houses and shops around the runway, therefore, “a relatively clean 2.4 GHz band” is realized and the transmission distance is almost the same as that specified in the catalog. Two or three model airplanes including spare airplanes are prepared at the same time when the flight test is carried in the runway (Fig. 6(b)) in case of its fall or depending on the purpose of flight test.

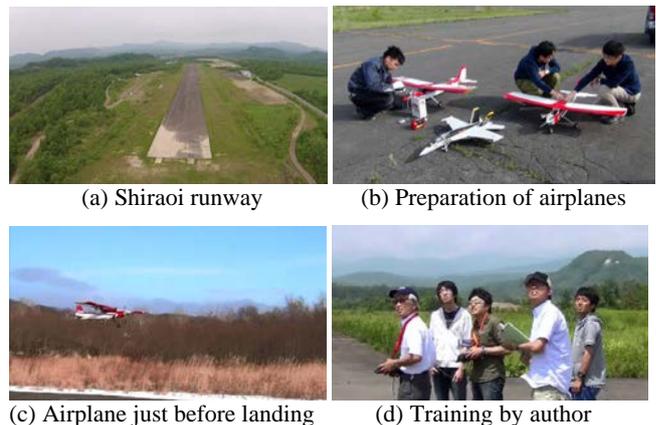


Fig. 6 Outdoor activities to fly autonomous airplanes at Shiraoi runway

One of the most important incentives for our students who are engaged in this research is that they can acquire skills to make and operate model airplanes and use the skill for their own research for flight verification. This skill, manual operation of model airplanes, is necessary to fly airplanes before switching to autonomous flight or after switching from autonomous flight. The most difficult operation is to land the airplane smoothly on the runway (Fig. 6(c)). To acquire this skill is to be full-fledged. Undergraduate students who are going on to graduate school are trained by me in Shiraoi runway (Fig. 6(d)). This training is making best use of Hokkaido which has a vast area of land. This cannot be followed by any universities in other area of Japan.

In addition to it, when airplanes are flid autonomously or manually, they sometimes fall to the ground and partially or totally destroyed. Whenever that happens, students have a good experience to repair the airplane or make a new one.

Field test of wireless communication system is also carried out nearby and along Shiraoi runway.

#### 5. Conclusions

In this letter, our research and education activities of guidance, navigation and control technologies are introduced which lead to space-plane and are planned as a flying test bed “Oowashi II”. Undergraduate and graduate students are much interested in understanding technologies including hardware through making or flying airplanes manually or autonomously.

# Helmet Antennas for Disaster Prevention

Hisashi Morishita  
National Defense Academy



## 1. Introduction

When we use a radio transceiver for disaster prevention (150 MHz band), there are some restrictions of rescue operations by holding the transceiver with a hand. Therefore, we propose the united structure that a transceiver, antenna and microphone are mounted on the helmet for disaster prevention which has already been served as shown in Fig. 1. In particular, since the wavelength is 2 m for 150 MHz, it is difficult to configure the antenna on the limited space of the helmet. Thus, we focus a folded dipole antenna that has the wideband characteristic and can be easily installed on the helmet, and fundamental characteristic is analyzed. Moreover, since the antenna is placed in the vicinity of the human head, we consider the restraint of radiation to the head direction using the human head model. As a result, we have established the method to lower the resonant frequency in the limited space of the helmet. Moreover, by loading the conductor plate inside of the helmet, we have confirmed that the radio wave toward the head is restricted.

## 2. Items of consideration for the helmet antenna

Helmet antennas are considered to be placed as wearable antennas and installed on the helmet for disaster prevention, construction work or fire fighting. Items of consideration for the helmet antenna can be divided into the external and internal items shown in Fig. 2. The external and internal items are related to the helmet and the antenna itself, respectively. The desired antenna, where the length is about half-wavelength, must be easily installed on the limited space on the helmet. As the helmet is made of the dielectric material and has a curved configuration, the effects of them must be investigated. In addition, the antenna's effects toward and from the human head are the most important items.

## 3. Configuration of the helmet antenna

Fig. 3 shows the perspective view of the helmet antenna composed of folded dipole antenna on hemispherical dielectric shell. The electrical parameters of the dielectric shell are  $\epsilon_r = 3.0$  and  $\tan \delta = 0.005$ . The radius of the hemispherical dielectric shell is 125 mm. Fig. 3(a) and (b) show the antenna structure without and with ring in proximity to human head. The length and width of the antenna element is 778 mm and 3 mm, respectively. The feed position is located at the back of human head. To achieve impedance matching, the open stub is arranged at the top of the meander part of the antenna element. The lengths of the open stub in

the antennas without and with ring are 10 mm and 173 mm, respectively. The copper ring with 13 mm width is arranged at 15 mm inside the antenna element. The CST Microwave Studio is employed for electromagnetic analysis [2].

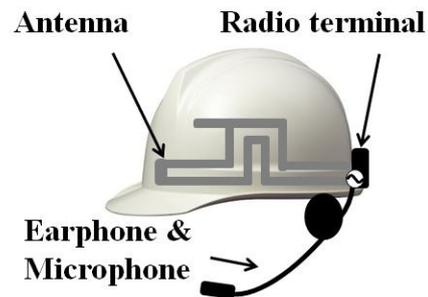


Fig. 1 The helmet antenna

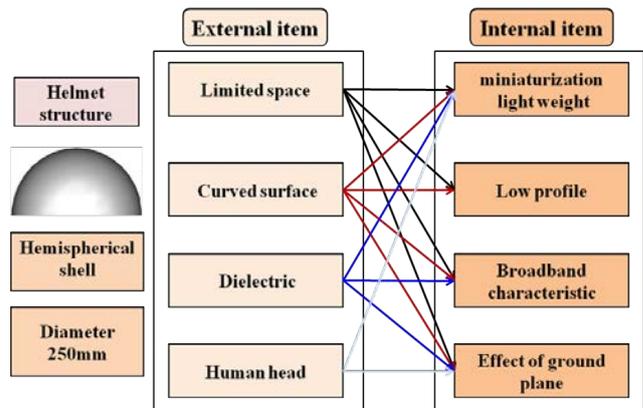


Fig. 2 Items of consideration for the helmet antenna

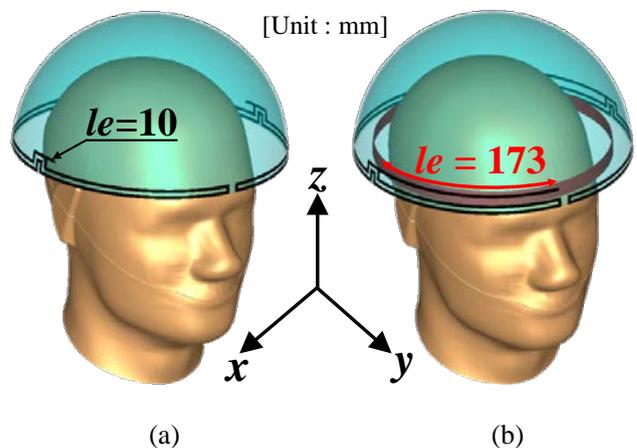


Fig. 3 Folded dipole antennas (a) without and (b) with ring

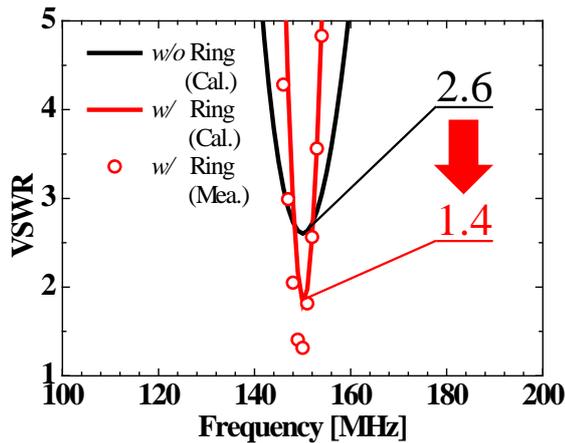
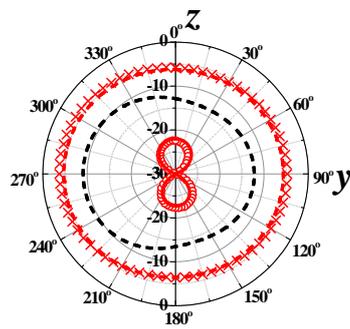
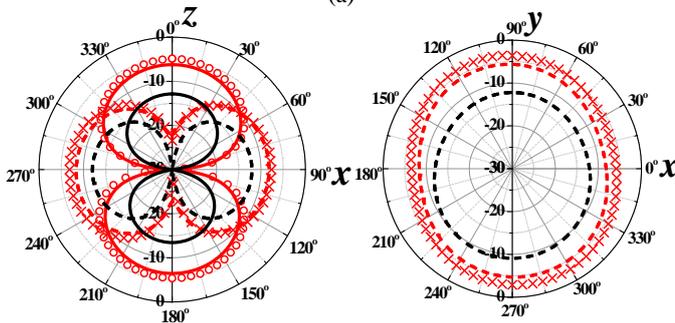


Fig. 4 VSWR characteristics



(a)



(b)

(c)

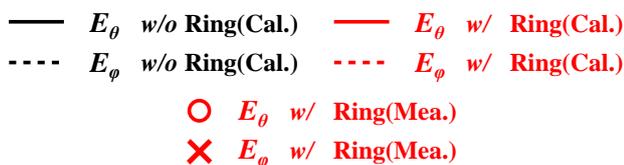


Fig. 5 Radiation patterns on (a) yz plane, (b) zx plane, and (c) xy plane

**4. Antenna characteristics**

Fig. 4 shows the VSWR characteristics. The resonant frequency is 150 MHz for disaster prevention. The VSWR can be improved from 2.6 to 1.4 by installing ring structure. The simulated and measured results agree well.

Fig. 5 shows the radiation patterns at 150 MHz. The radiation efficiency can be improved by installing ring. The maximum gain of the antennas without and with ring become  $-9.1$  dBi and  $-4.6$  dBi, respectively.

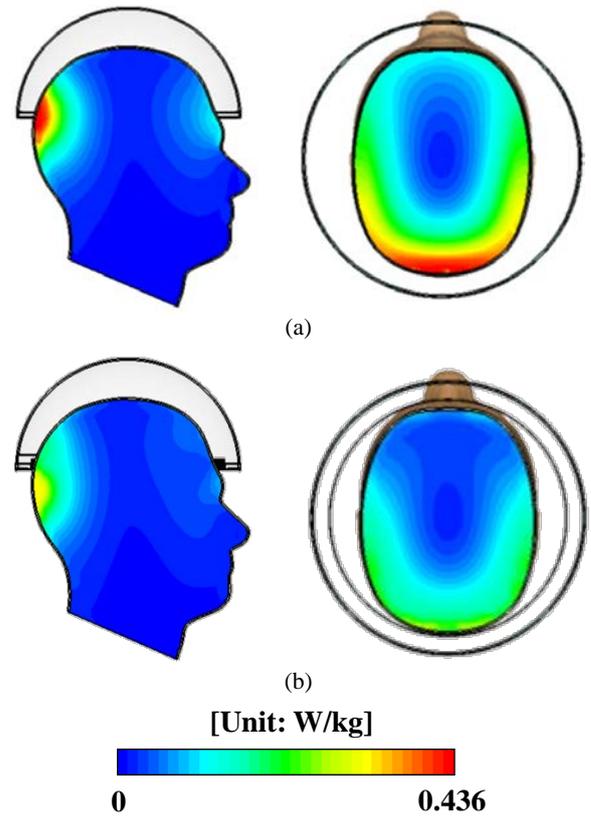


Fig. 6 SAR distributions of the antennas (a) without and (b) with ring in yz plane and xy plane

The measure radiation patterns are in good agreement with the simulated results.

Fig. 6 shows the SAR distributions of the antennas without and with ring at 150 MHz in yz plane and xy plane. The peak SAR is observed at around feed point which is located at the back of the human head. The radiation toward the human head can be suppressed by installing ring. The maximum values of 10 g average local SAR of the antennas without and with ring becomes 0.44 W/kg and 0.37 W/kg, respectively.

**5. Conclusion**

The helmet antenna for disaster prevention is investigated. By loading the ring inside the helmet, the VSWR and radiation efficiency can be improved. As a result, the radiation toward the human head can be suppressed and the peak SAR values can be reduced.

**6. References**

[1] T. Nakao, H. T. Nguyen, M. Nagatoshi, and H. Morishita, "Fundamental study on curved folded dipole antenna," *IEEE AP-S Int'l Symp.*, Chicago, IL, pp.1-2, July 2012.  
 [2] CST Microwave Studio Ver. 2015.

# Report on EMC Joint Workshop 2015 Bangkok (EMCJ WS 2015, Bangkok)

Yoshitaka Toyota

Secretary of Technical Committee of Electromagnetic Compatibility



## 1. Introduction

The EMC Joint Workshop 2015 Bangkok (EMCJ WS 2015, Bangkok), which is the first international conference held outside of Japan as one of internationalization activities organized by Technical Committee on Electromagnetic Compatibility (TC-EMCJ), was held at King Mongkut's Institute of Technology Ladkrabang (KMITL) in Bangkok, Thailand from June 24<sup>th</sup> to 26<sup>th</sup>, 2015. This workshop was collocated by Technical Meeting on Electromagnetic Compatibility of IEEJ (IEE-EMC) and Technical Meeting on Magnetics of IEEJ (IEE-MAG), and hosted and supported by Electrical Engineering Department, KMITL.

## 2. Technical Sessions

As shown in Fig. 1, the workshop started with opening addresses by Professor Hideaki Sone, Committee chair of TC-EMCJ and Associate Professor Werachet Khan-ngern, local host of EMCJ WS 2015, Bangkok. Then, the opening address was also given by Dr. Sompob Plomai, Head of Electrical Engineering Department, KMITL.

In 6 technical sessions over 2 days at KMITL (Fig. 2), 18 technical papers were presented as shown in Table 1. We had 3 invited and 10 regular talks in 5 oral sessions and 5 technical presentations in 1 poster session. Also, 5 papers of them were presented by graduate students. We had fruitful discussions in the workshop.

The brief program is listed as follows.

*June 25<sup>th</sup>*

Regular Session 1

- 1) EMI reduction by extended spread spectrum in switching converter
- 2) Study on application of the preference set-based design method to layout of microstrip lines with required performances
- 3) A study on imbalance component and EM radiation from bent equi-length differential-paired lines
- 4) A study on characterization of conducted emission in DC-DC converter based on spectrogram analysis
- 5) A study on equivalent circuit modeling of transformer to simulate ringing phenomena associated with switching operation in fly-back converter

Invited Talk 1

- 1) Planar EBG structure with ferrite thin film for power-bus noise reduction



Fig. 1 Opening address by committee chair



Fig. 2 Workshop site at KMITL

Table 1 Number of technical papers

|          | Oral | Poster | Total |
|----------|------|--------|-------|
| Japan    | 11   | 4      | 15    |
| Thailand | 2    | 1      | 3     |
| Total    | 13   | 5      | 18    |

- 2) Development of EMC toolkit for undergraduate laboratory based on Buddhist's precept

*June 26<sup>th</sup>*

Regular Session 2

- 1) Comparison of preliminary breakdown pulses of cloud-to-ground and intracloud lightning flashes using BOLT and phased array radar
- 2) Analysis of shielding effectiveness of magnetic thin-film noise suppressor

Invited Talk 2

- 1) EMC facilities for products certification for AEC

Poster Session

- 1) Effect of clock frequencies on EM information leakage from cryptographic devices
- 2) SAR estimations for a human body owing to various positions of a typical tablet computer

- 3) SAR estimation in computational human models of an infant and children representing the ICRP reference anatomical data
- 4) EMC activities in Thailand
- 5) Experimental study on relationship between electrode approaching speed and variation in the amplitude of electromagnetic radiation due to ESD

#### Regular Session 3

- 1) A study on broadband measurement of complex permittivity for liquids using the open-ended coaxial line reflection method
- 2) Influence of incident electric field to SAR in a human body close to a wireless power transfer system in MHz-band frequency
- 3) Macro model of LDO voltage regulator for estimation of immunity to conducted disturbance

### 3. Attendees

As shown in Table 2, the number of attendees from both countries of Japan and Thailand in the technical sessions of the workshop was about 30, each of 2 days. Thai attendees were professors and graduate students of KMITL and Khon Kaen University. Japanese attendees were professors, graduate students, researchers, and engineers of universities, national laboratories, and private companies (Fig. 3).

Table 2 Number of attendees

|          | June 25 | June 26 |
|----------|---------|---------|
| Japan    | 19      | 20      |
| Thailand | 10      | 12      |
| Total    | 29      | 32      |



Fig. 3 Workshop attendees

### 4. Technical Visits

A couple of technical visits were arranged through the courtesy of Associate Professor Werachet Khan-ngern. We first visited a new site of Electrical and Electronic Products Testing Center (PTEC) on June 24<sup>th</sup> (Fig. 4). On June 25<sup>th</sup>, next, we visited PTEC located in KMITL, where we saw not only a lot of test equipment and facilities used for EMC testing but also evaluation equipment used for various testing. On last day of the workshop, we visited laboratories for undergraduate education, which most impressed all of Japanese attendees because they were even more complete than we had ever seen in Japanese universities.



Fig. 4 Visit to new site of PTEC on June 24

### 5. Banquet

In the evening of June 25<sup>th</sup>, we enjoyed a dinner cruise on the Chaophraya River. We spent exciting and memorable time with delight Thai cuisine. Also, we enjoyed the live music, Thai classical dance, and the exotic Special Show “CABARET SHOW on CRUISE”.



Fig. 5 Dinner cruise banquet

### 6. Conclusion

The first international conference held outside of Japan, EMCJ WS 2015, Bangkok was successfully closed. TC-EMCJ would like to thank all the speakers and attendees for their contribution to EMCJ WS 2015, Bangkok. All of us experienced valuable things in Thailand (Fig. 6). TC-EMCJ greatly appreciates warm hospitality by local staff members including Associate Professor Werachet Khan-ngern.

The next workshop is now been arranged to be held in Taiwan. We are looking forward to seeing you in Taiwan.



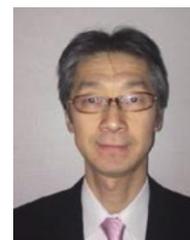
Fig. 6 Traditional respect to King Mongkut's monument

### 7. Reference

- [1] <http://www.ieice.org/cs/emcj/jpn/regular/emcj-ws.html>

# Annual Report of Technical Committee on Network Systems

Atsushi HIRAMATSU<sup>†</sup>, NTT-AT Corp.  
 Hideki TODOE<sup>††</sup>, Osaka Prefecture University  
 Takuji TACHIBANA<sup>†††</sup>, University of Fukui  
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<sup>†</sup>Chair, <sup>††</sup>Vice Chair, <sup>†††</sup>Secretary, <sup>††††</sup>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 2014.

## 2. Technical Meetings

The schedule from April 2014 to March 2015 consists of 10 technical meetings and one workshop (as shown in Table 1). Several meetings are co-located with the OCS (Optical Communication Systems), PN (Photonic Network), RCS (Radio Communication Systems), ASN (Ambient intelligence and Sensor Networks), SR (Smart Radio), CS (Communication Systems), IN (Information Networks), ICM (Information and Communication Management), or CQ (Communication Quality) committees.

Recently presented papers mainly focus on technologies that support new generation network, SDN, network virtualization, cloud computing, green ICT, ad-hoc networks, P2P networking, traffic

control / measurement, quality of service (QoS), and security issues. At each technical meeting, we host lectures by invited speakers who are experts in their fields. During this fiscal year, we have had invited lectures on network operation, SDN, IoT, disaster resilient network, content delivery system, high-speed simulation, wireless network, SFC, ICN/CCN and other topics. In fiscal 2014, we had 190 presentations from academia and 93 from industry.

Since June 2003, we have fostered the work of young researchers who have presented papers at technical meetings by inviting them to give a follow-up talk some months later. We call these the “encouragement talk.” We invited 7 young researchers to give such talks in the past year. We will continue this activity.

## 3. Research Awards 2014

The Technical Committee selected recipients of the Network System Research Award from among 225 regular papers that had been presented at monthly technical meetings from January to December 2014. The award is given to the authors of the three or four

Table 1 Technical Meeting Schedule for Fiscal 2014

| Date                | Location                                  | Theme   | Co-location with |
|---------------------|---|---|------------------|
| Apr<br>17–18        | Ishigaki City Hall<br>(Okinawa)           | Traffic, Network evaluation, Performance, Resource Management/Control, Traffic Engineering, Reliability, Resiliency |                  |
| May<br>15–16        | University of Yamanashi<br>(Yamanashi)    | Advanced Protocol and Network Control, Network System Architecture  |                  |
| June<br>26–27       | B-Con Plaza<br>(Oita)                     | Core/metro system, Photonic network system, Optical network design, Traffic engineering, Signaling, Ethernet, etc   | OCS, PN          |
| July<br>30–August 1 | Kyoto Terrsa<br>(Kyoto)                   | Wireless Distributed Network, M2M: Machine-to-Machine, D2D: Device-to-Device, etc.                                  | ASN, RCS, SR     |
| September<br>11–12  | Tohoku University<br>(Miyagi)             | Post IP networking, New Generation Network, Contingency Plan/BCP, Network configuration, etc.                       | CS, IN           |
| October<br>16–17    | Matsue Terrsa<br>(Shimane)                | Network Architecture (Overlay, P2P, Ubiquitous Network, Active Network, NGN, New Generation Network), Grid          |                  |
| November<br>13–14   | Kochi City Culture-Plaza CUL-PORT (Kochi) | Network Management, NGN Architecture, NGN Operation, Traffic Modeling, QoS Measurement, etc                         | CQ, ICM          |
| December<br>18–19   | Ise Tourism and Culture Center<br>(Mie)   | Mobile Ad-hoc Network, Ubiquitous Network, Wireless Communication, security, Multi-Access Network                   | RCS              |
| January<br>22–23    | Hachijocho City Hall<br>(Tokyo)           | Network Software, Network Application, SOA/SDP, NGN/IMS/API, Distributed Control/Dynamic Routing, Grid              |                  |
| March<br>2–3        | Okinawa Convention Center<br>(Okinawa)    | General, NS+IN workshop (March 2)   | IN               |

best papers of each year. The 2014 recipients attended the award ceremony at the NS/IN Workshop (Fig. 1) held in Okinawa in March 2015. The abstracts of the four papers that won awards in 2014 are as follows.

**Natsuko Ohuchi, Tsutomu Saito, Shinji Iwaki, Youichiro Ueno, and Noriharu Miyaho: “Core Network Control for End-to-End Delay Guaranteed Network” [1]**

It is predicted that challenges other than the shortage of communication bandwidth will occur in the near future. One such challenge is QoS technology regarding with the delay guarantee that will be required when delay-sensitive communication services are provided to the market. Delay-sensitive communication services are services for which even a slight end-to-end delay can cause substantial influence or bad impacts, such as online trading, multi-sensory communication as typified by telesurgery, and inter-datacenter communications. On the one hand, aiming at the early realization of high-speed and high-capacity packet router, the development of an opt-electronic packet router has been promoted. By limiting the input traffic into the opt-electronic packet router, switching delay time can be guaranteed less than some certain threshold value.

In this paper, we are going to realize a delay guaranteed network service, by deploying above mentioned packet routers in a core network and handling them in a simple manner for providing the corresponding services. The proposed method is targeted to the connection-oriented based communication. We defined seven delay-guaranteed QoS classes and allocate path to the connection in accordance with the delay class. We solve the delay-guaranteed path allocation problem by using Martins Pascal Santos algorithm, to cut down the calculation time and balancing traffic load properly. We apply OpenFlow to control the opt-electronic routers for switching the traffic to appropriate direction according to the allocated path. We implemented a control node “path allocation system” on a Linux computer and combined this system into a network simulator (QualNet). We used JGN-X topology for Japan Core Network model in the simulations. Our evaluation results show that when network usage is less than about 30%, the delay-guaranteed communication services are realizable for all application traffic.

**Noriaki Kamiyama, Yousuke Takahashi, Keisuke Ishibashi, Kohei Shiimoto, Tatsuya Otoshi, Yuichi Ohsita, and Masayuki Murata: “Aggregating Flows for Traffic Engineering” [2]**

In the Internet, the link loads change due to variations in the traffic demand matrix and to route fluctuations caused by failures, and this led to the development of various traffic engineering (TE) methods that balance the link loads by dynamically configuring the packet routes. In many of these TE methods, the packet routes are set in units of

destination network addresses, which is a coarse granularity, so effectively balancing the link load with these TE methods is difficult. In an SDN/OpenFlow network, packet flows can be defined as any combinations of fields in the packet header, and it enables fine-grained control of routes. However, the routers and controller need to keep the state of each unit of route setting, so if we set flows defined by the five fields in the packet header, i.e., micro flows, as the unit of route control, the number of states to be kept by routers and controller is huge, and applying this approach to large-scale networks is difficult. Therefore, routes should be controlled with coarser-grained granularity than micro flows and finer-grained granularity than the mixture of flows aggregated by flow destination network address. In other words, it is effective to control the routes by using  $\{\text{it macro flow}\}$  units defined in terms of groups of micro flows with the same origin and destination network addresses.

In this paper, we thus propose two methods for aggregating micro flows into macro flows to be used effectively as TE targets. The first method is based on a greedy algorithm that optimizes a single criterion, and the second method clusters micro flows with similar traffic variation patterns into groups and optimizes the traffic ratio of extracted from each cluster to aggregate into each macro flow. Evaluation using traffic demand matrixes for 48 hours of Internet2 traffic demonstrated that the proposed methods can reduce the number of TE targets to about 1/50 to 1/400 without degrading the link-load balancing effect of TE.

**Hideyuki Koto, Norihiro Fukumoto, Sumaru Niida, Shigehiro Ano, Shin'ichi Arakawa, and Masayuki Murata: “Analysis of Network Quality Effects on Users’ Communication Behavior during Web Browsing” [3]**

Smartphones are getting increasing popular and users are enjoying variety of applications over mobile networks. In addition, the contents of the Internet are becoming richer and more developed. In these situations, the quality of communication network plays a key role to determine the experience perceived by users. Traditionally, network qualities such as packet loss rate, delay, jitter, throughput etc., are monitored as QoS. Although these features of QoS are still important, they are not sufficient to understand what the users are actually experiencing.

In this paper, we analyze the behavior and reaction of users to network quality during web browsing on smartphones. In addition, since web browsing is a flow experience, we evaluate users’ behavior as a series of multiple actions. In order to do so, we introduce a method to convert traffic in units of packets and TCP/HTTP sessions, into units of user’s actions. We show that the observed behavior of users’ web usage coincides with the MOS obtained through independent subjective analysis: The condition of throughput where the users’ continuous behavior changes matches with the condition where the MOS starts to degrades. In

addition, the obtained results illustrate that the users perform various reactions depending on the perceived network quality. Specifically, users generate more web traffic and transactions when the qualities of the network are both good and poor.

**Sakie Horiuchi, Kazunori Miyoshi, Tutomu Murase, and Takuji Tachibana: “Simulation Evaluation of System Throughput by Considering Capture Effect in Densely Deployed Wireless LANs” [4]**

In this paper, we analyzed the system throughput of the densely deployed wireless LANs (WLANs) considering the capture effect and the interference. In the densely deployed WLANs, WLANs utilize multiple wireless frequency channels that overlap each other. In such environments, the transmission of WLANs are interfered each other so that the system throughput degrades. The degree of the interference depends on the distance between wireless devices, such as terminals and access points. On the other hand, the packet transmission succeeds by the capture effect if the SINR is larger than a threshold even when the interferences occur. When the capture effect is obtained in multiple WLANs, packet transmissions can be achieved in the WLANs in parallel. As a result, the system throughput can be increased even in the densely deployed WLANs. However, such a system throughput that is affected by the capture effect and the interference has not been analyzed in details. Therefore, we analyzed the transmission probabilities for each terminal and each access point based on their positions. Using the transmission probabilities, the throughput for each WLAN was calculated. The error between our analysis and the experimental result is at most 6.5 %. This result shows the validity of our analysis.

#### 4. Future Plans

The Technical Committee will have also 10 technical meetings in this fiscal year. In addition, it will organize open Symposia in the IEICE Conferences, one of which will be on “Advanced Networking Technologies for Innovative Information Networks” at the IEICE General Conference in March 2016.

(For more information, please see our home page.

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



Fig. 1 Research award recipients with chair Mr. Hiramatsu

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# Annual Report of Technical Committee on Communication Systems

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## 1. Introduction

Technical Committee on Communication Systems (CS) actively organized seven technical conferences and one special workshop at various cities in Japan, in FY2014. In this report, we describe our activities which include seven technical conferences, Communication Systems Workshop (CSWS), special and general sessions on IEICE Society Conference 2014 and IEICE General Conference 2015, and CS Technical Committee's Prizes. 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:

- Transport technology,
- Modulation, coding and signal processing,
- Network architecture,
- Wireless network and application,
- Network service and application.

We are welcome to make your presentations to our conferences.

## 2. Summary of CS Technical Committee in FY2014

In Table 1, we summarize the activities of CS Technical Committee in FY2012, FY2013 and FY2014.

The number of presented papers on technical

conferences was more than 100 each year in three years. The total number of presented papers on IEICE Society and General Conferences is increasing every year and more than 120 papers had presented in this year. 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 around 40 in average.

We had many interesting special invited talks by outstanding speakers in each conference. One of the most impressive talks was presented by Dr. Tatsuhiro Noguchi of Mitsubishi Electric Corporation in CS technical conference on 3<sup>rd</sup> July 2014 in Tanegashima Island (Fig. 1). He presented next generation wideband satellite communication technologies. His talk provided us future of satellite technologies including the needs and seeds. Another talk, impressively embedded in our memory, was presented by Prof. Yoshikazu Miyanaga of Hokkaido University in CS workshop on 5<sup>th</sup> November 2014 Shiretoko, Hokkaido. He explained radio transmission technologies for video transmission. It achieves very high rate transmission while reducing power consumption.

Through the FY2014, 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>).

Table 1 Summary of CS Technical Committee activities

|        | Number of presented papers |   | Special session on<br>IEICE Society Conference<br>(Number of participants)                        | Special session on<br>IEICE General<br>Conference<br>(Number of participants) | Number of<br>participants<br>of CSWS |
|--------|----------------------------|---|---|---|--------------------------------------|
|        | Technical<br>Conferences   | IEICE<br>Society/General<br>Conferences |   |   |                                      |
| FY2012 | 104                        | 32/83 (115)                             | Current status and trend of<br>optical access and wireless<br>access network technologies<br>(40) | Communication technology<br>for M2M (45)                                      | 38                                   |
| FY2013 | 110                        | 61/76 (137)                             | Low power and energy<br>efficient technologies for<br>wired and wireless networks<br>(44)         | How to teach and learn ICT<br>(30)  | 47                                   |
| FY2014 | 110                        | 52/70 (122)                             | Issues on convergence of<br>mobile and optical-access<br>networks (74)                            | Application of ICT to traffic<br>field (49)                                   | 47                                   |



Fig. 1 Dr. Tatsuhiko Noguchi giving a special invited talk at CS technical conference in Tanegashima Is. on July 2014



Fig. 2 Prof. Yoshikazu Miyanaga giving a special invited talk at CS workshop in Hokkaido on November 2013

### 3. Activities of CS Technical Committee in FY2014

#### 3.1 Technical Conferences

We have already held July's conference on 2<sup>nd</sup> – 3<sup>rd</sup> July 2015, in Kumejima Island, successively, with three special invited speakers on ICT, 26 invited and general session speakers, and more than 30 participants. First special invited speaker, Prof. Fumiyuki Adachi of Tohoku University presented challenges toward spectrum-energy efficient mobile wireless networks. Second special invited speaker, Prof. Masayuki Tanimoto of Nagoya Industrial Science Research Institute showed recent progress in free-viewpoint

video generation and transmission technologies. Third invited speaker, Dr. Tomohiro Ishihara of Fujitsu Laboratories Ltd. presented software and network technologies of network function virtualization (NFV).

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 “Recent progress of Internet of Things (IoT)

Table 2 Technical Conferences schedule, May 2015 – April 2016

| Date         | Venue                                   | Joint committee       | Topics   |
|--------------|---|-----------------------|--|
| July 3 – 4   | Eef information plaza (Kumejima Island) | –                     | Next Generation Networks, Access Network, Broadband Access System, Power-Line Communications, Wireless Communication System, Coding System, etc.   |
| Sept. 3 – 4  | Iwate Prefecture Hall                   | 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. |
| Nov. 11 – 13 | Souumkyo (Hokkaido)                     | CSWS                  | Broadband Access Systems, Home Networks, Network Services, Applications for Communications, etc.   |
| Dec. 3 – 4   | Kobe Univ.                              | IPSJ-AVM, IE, ITE-BCT | Image Coding, Streaming, etc.  |
| Jan. 21 – 22 | Kagoshima Univ.                         | OCS                   | Core/Metro System, Optical Access System/Next Generation PON, Broadband Access System, (Wide Area) Ethernet, Optical Transport Network (OTN), High-Speed Interface, Analog Optical Transmission, Quantum Communication, etc.         |
| March 3 – 4  | Nanki-Shirahama (Wakayama)              | CAS                   | Network Processor, Signal Processing for Communication, Wireless LAN/PAN, etc.   |
| Apr. (TBA)   | TBA                                     | CQ, NV                | SDN (Software-Defined Network), Cloud, Network Virtualization, Service Quality, Contents Delivery, etc.  |

and its application to cyber physical” on 9<sup>th</sup> September 2015, in the IEICE Society Conference 2015 (September 8<sup>th</sup>–11<sup>th</sup>, 2015, Tohoku Univ., Sendai). Outstanding four speakers will be invited.

For the IEICE General Conference 2016 (March 15<sup>th</sup>–18<sup>th</sup>, 2016, Kyushu Univ., Hakata), we are now planning to have a highly motivated tutorial session.

### 3.3 CS Workshop

CS Workshop 2015 will be held in Hokkaido, on 11<sup>th</sup>–13<sup>th</sup> November 2015. Dr. Tetsuya Yokotani, General Chair of the workshop, has invited eight outstanding researchers for providing talks about state-of-the-art innovative IoT. Please visit to the web site (<http://www.ieice.org/cs/cs/jpn/cs/ws/index-e.html>) for more information.

### 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. At least one of authors must be a member of the IEICE on the presentation day. Invited and special talks are excluded. |
| 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 and a member of the IEICE or a student on the presentation day. His/her paper must be submitted to the IEICE committee on communication systems.      |

The winners of the chairman’s prize in 2014 are the authors of two papers [1, 2]. The speakers of the papers are Dr. Kenji Miyamoto and Mr. Tomoya Kageyama.

The winners of the encouraging prize in 2014 are the speakers of four papers [3–5], Mr. Komei Shimamura, Mr. Kentaroh Toyoda, and Mr. Hikaru Kawasaki.

Four invited talks by the speakers of CS2014-18, CS2014-99, CS2014-59, and CS2014-92 were conducted and the prize ceremony 2014 was held at the banquet in the technical conference of Kumejima Island on July 2<sup>nd</sup>, 2015. The ceremonial photograph is illustrated in Fig. 3.



Fig. 3 The prize ceremony 2015 in Kumejima Island on July 2<sup>nd</sup>, 2015. From back left, Mr. Toyoda, Mr. Kawasaki, and Dr. Kuwano. From front left, Mr. Kageyama, Prof. Muta, Prof. Tsuboi (CS Chair), and Dr. Miyamoto

## 4. Conclusion

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

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## Technical Committee on Smart Radio –A Challenge to New Frontiers and International Activities–

Takeo Fujii, Akemi Tanaka, Junichi Tanaka,  
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Technical Committee on Smart Radio



### 1. Introduction

TCSR changed its own name from “Technical Committee on Software Radio” to “Technical Committee on Smart Radio” in April 2014. This paper presents the first year report of the new TCSR activities. The vision of the new TCSR is “Advancing new frontiers in future wireless technologies.” Technical Committee of Software Radio was established in 1998 and its main target was researches on software defined radio (SDR). In these days, SDR is implemented in many wireless systems like base station of cellular systems, public safety systems, TV broadcasting receivers and so on. On the other hand, smart and intelligent wireless systems and devices are key technologies not only 5G mobile systems but also future sustainable wireless networks beyond 5G systems. Smart radio is a general term for multi-functional wireless terminals and wireless networks that include the concept of software radio, cognitive radio, heterogeneous networks, and spectrum management. This change of the name is intended to expand the technical fields of TCSR for contributing to future sustainable wireless technologies.

In this year, five technical conferences including one international workshop and four domestic workshops were held. We successfully launch an international technical conference called Smartcom 2014 in Singapore. This workshop is the first workshop organized by TCSR outside of Japan. A large number of participants from Singapore and Japan discuss future collaborations in the technical fields of smart radio.

On May 2015, the chair of TCSR was changed from Prof. Kei Sakaguchi (Tokyo Institute of Technology) to Prof. Takeo Fujii (The University of Electro-Communications). The new organizing members recognize Year 2015 is an important year to progress new TCSR for expanding and developing technical fields for sustainable future wireless academia and industry all over the world. We set missions of our new TCSR as globalization, sustainable development with finding advanced technical fields, and encouraging young researchers and students. In this fiscal year, we plan five workshops including SmartCom 2015 at Tokyo in October 2015. In IEICE society conference,

we also plan a tutorial by a researcher from outside of Japan to promote global view of our technical fields. Now, we also plan SmartCom 2016 at Oulu, Finland on May 2016.

We hope TCSR activities enhance IEICE activities and also boost academia and industrial development in our research fields for contributing future wireless worlds.

### 2. Technical Conferences in Fiscal Year 2014

#### 2.1 The 1<sup>st</sup> Technical Conference in May 2014

- ✓ Topics: Technical Exhibition, Product Exhibition, Cognitive radio, SDR, HetNet, etc.
- ✓ Date: May 22<sup>nd</sup> – 23<sup>rd</sup>, 2014
- ✓ Venue: Toshiba Education & Training Institute (Yokohama)
- ✓ Number of papers: 29
- ✓ Number of Technical Exhibits: 12
- ✓ Number of participants: 150

It was the first technical conference after the technical committee changed its name from Software Radio to Smart Radio.

#### *Invited Talks (TCSR Renaming Commemoration):*

We had 2 invited talks in the session.

The first talk by Prof. Harada included episodes from the time of SR Technical Committee inauguration. The second talk by Prof. Nakajima was about the breakthrough technology in the wireless communication technology.

- Prof. Harada (Kyoto Univ.) talked about “Prospect of Research and Development on Spectrum Management based Advanced Radio Technologies (SMART).”
- Prof. Nakajima (UEC) talked about “Expectation for Creating New Wireless Applications”.

#### *Invited Talks*

We had 2 invited talks in the session. These sessions touched on ADC techniques, standardization of ultra high speed next generation wireless LAN and so on.

- Prof. Matsuzawa (Tokyo Institute of Technology), “Analog to Digital Conversion Technology for Software Defined Radio”
- Dr. Matsuoka (Toshiba), “Research and development of wireless technologies for realization of smart community”

### **Requested Exhibits Tutorial**

We had 3 requested exhibits tutorial.

- The current situation of the software defined radio machine in NEC (NEC)
- An efficient multi-channel utilization method for wireless backbone network (Univ. of Tokyo and Kyushu Inst. of Tech.)
- Experimental study on C-plane/U-plane split heterogeneous cellular networks (Panasonic, KDDI R&D Labs., Tokyo Inst. of Tech., and Osaka Univ.)

### **General Session**

In the general session, 6 papers were presented and accompanied by lively discussions. These sessions included diversified topics e.g.

- Spectrum sharing
- Spectrum sensing
- 1-bit digital RF transmitter
- Detection for OFDM signal
- Multidimensional TCM for the IEEE 802.22 WRAN
- Construction of channel connection time rate

### **Technical Exhibit**

We had 12 Technical Exhibits and 7 product exhibits. The exhibit was crowded with many visitors from beginning to end.



Fig. 1 Technical and Product Exhibits at May conference

### **Awards**

TCSR awards to the papers presented in fiscal year 2013 were announced as followings at the award ceremony. The awards were given to presenters of the papers. The award recipients gave acceptance speeches.

- For paper award, “New Wireless Infrastructure for Battery-less Sensor Networks in Indoor Environments”, (Osaka Univ. and Tokyo Inst. of Tech).
- For research incentive award, “Physical Layer Security Using Multi-band Transmission Considering Power Allocation and Channel Selection”, (UEC).
- For special technical award, “White Space Communication Network with IEEE 802.11af/IEEE 802.22 Capable of Primary User Protection and Secondary User Coexistence”, (NICT and Hitachi Kokusai Electric).

### **2.2 The 2<sup>nd</sup> Technical Conference in July 2014**

- ✓ Topics: Wireless Distributed Networks, Machine-to-Machine (M2M), Device-to-Device (D2D)
- ✓ Date: July 30<sup>th</sup>, 31<sup>th</sup>, and Aug. 1<sup>st</sup>, 2014
- ✓ Joint TCs: ASN, NS, RCS, RRRC
- ✓ Venue: Kyoto Terrsa, Kyoto
- ✓ Number of papers: 39 (Invited talks: 5, Poster talks: 24, Regular talks: 10)
- ✓ Number of participants: 328

### **Poster Sessions: Wireless Distributed Networks**

Two poster sessions were held in collaboration with five TCs. The total 24 attractive posters were presented (Fig. 2). The session fields as follows:

- Development of a Sensor Network (6 posters)
- QoS Compensation (1 posters)
- Development of Radio Communication System (8 posters)
- Spectrum sensing for TVWS (2 posters)
- Sensing and resource control for cognitive radio (1 posters)
- Green wireless (1 posters)
- Energy harvesting (1 posters)
- Connection between wired and wireless (4 posters)



Fig. 2 Poster Session jointly organized by five TCs at July conference

**Invited Talk: M2M/D2D**

Prof. Takeo Fujii (UEC) talked about “Highly Efficient Spectrum Utilization Cooperated with Spectrum Database”.

Prof. Kazunori Hayashi (Kyoto University) talked about “MUSIC Algorithm using Khatri-Rao Product Array and Compressed Sensing”.

Prof. Akinori Taira (Tohoku University) talked about “SS-CDMA for Location and Short Message Communication using QZSS”

Mr. Hiroshi Ootsuka (NTT Data) talked about “A study of system integration related to advanced IT networks in IoT”.

Prof. Takekazu Kato (Kyoto University) talked about “Constructing Smart Community by Cooperative Distributed Prosumers”.

**General Session**

In the general sessions, 10 papers were presented and fruitful discussions were conducted

These sessions included following technical fields:

- Prototype Model for Experimental Study
- Spectrum sensing
- TV white space communication systems

**2.3 The 3<sup>rd</sup> Technical Conference in October 2014**

- ✓ Topics: Heterogeneous wireless networks, Cognitive radio networks, dynamic spectrum management
- ✓ Date: Oct. 30<sup>th</sup> – 31<sup>st</sup>, 2014
- ✓ Venue: Infuse Theatre, Fusionopolis, Singapore
- ✓ Co-organizers: Advanced Communication Technology (ACT) Department, Institute for Infocomm Research (I<sup>2</sup>R) and TCSR
- ✓ Co-sponsors: Modulation & Coding Department (MnC) I<sup>2</sup>R, IEEE VTS SG chapter, and IEEE COMSOC Japan chapter
- ✓ Number of papers: 58 (Opening talks: 2, Keynotes: 2, Invalid talks: 13, Poster talks: 30, Technical exhibitions: 9, Product exhibitions: 2)
- ✓ Number of participants: 128

**Opening and Keynote Talks**

On the first day, this workshop was started from opening remarks by Dr. Haizhou Li (I<sup>2</sup>R). Subsequently, Prof. Kei Sakaguchi (Osaka University) and Dr. Sumei Sun (I<sup>2</sup>R) respectively gave an opening talk.

Prof. Hiroshi Harada (Kyoto University / NICT) gave a keynote talk about “Spectrum Management based Advanced Radio Technologies --Research, Development, Standardization and Trial--”. On the second day, Dr. Ying-Chang Liang (I<sup>2</sup>R) gave a keynote talk about “Spectrum Sharing for 5G Networks”

**Special Sessions**

Three special sessions were held during the two days in workshop. There were total 13 invited talks. Their session themes are listed as follows:

- Session 1, “Future Advanced Wireless Systems” (5 invited talks)
- Session 2, “Energy Harvesting and Wireless Power Transfer Technologies” (4 invited talks)
- Session 3, “Reliable Communications for Control and M2M” (4 invited talks)

**Poster Sessions with Technical Exhibitions**

Two poster sessions with technical exhibitions were held in each day. The session in the first day had 15 poster presentations and 5 technical exhibitions, the other session in the second day had 15 poster presentations and 4 technical exhibitions. In two sessions, active discussions for various topics related to smart wireless communications were conducted with participants from both Singapore and Japan.



(a) Presentations using posters



(b) Some presentations showing technical exhibits

Fig. 3 Poster session at October conference (SmartCom 2014) held in Singapore

**2.4 The 4<sup>th</sup> Technical Conference in January 2015**

- ✓ Topics: Cognitive Radio Network, Heterogeneous Network, Cross-layer Radio Technologies, Software Defined Network (SDN)
- ✓ Date: January 29<sup>th</sup> – 30<sup>th</sup>, 2015
- ✓ Venue: KKR Hakodate
- ✓ Number of papers: 17 (Invited talk: 1, Regular talks 16)
- ✓ Number of participants: 69

### Invited Talks

On the first day, Prof. Kenta Umebayashi (Tokyo University of Agriculture and Technology) talked about “Study on smart spectrum access”. In this talk, he introduced spectrum monitoring systems and spectrum sensing technics for realization of dynamic spectrum access by monitoring on spectrum utilization. As additional talk related to evening session, he introduced his experience on research in foreign country and collaboration, and encouraged young researchers to get experience in foreign country.

### General Session

In the general sessions, 16 papers were presented and accompanied by fruitful discussions on the first and second days. These sessions included technical fields as follows:

- Sensing, measurement, monitoring and analyzing on radio utilization and propagation modeling
- 5G systems
- Adaptive transmission systems based on location, QoE, etc.
- QZSS systems
- Massive MIMO
- Public safety communication systems

### Evening Session

On the first day evening, we organized evening session and discussed how to encourage Ph.D. student to attend technical committee. In this session, we invited Ph.D. students and Ph.D. researchers as panelists. They introduced their experience in Ph.D. course and talked pros and cons to go on to Ph.D. course. Finally, master and bachelor degree students talked their impression of the discussion.



Fig. 4 Evening session to encourage Ph.D students at January conference

## 2.5 The 5<sup>th</sup> Technical Conference in March 2015

- ✓ Topics: Mobile communication workshop
- ✓ Date: March 4<sup>th</sup> -6<sup>th</sup>, 2015

- ✓ Joint TCs: RCS, SRW, CCS, and IEEE VTS Japan Chapter
- ✓ Venue: Tokyo Institute of Technology (Ookayama campus), Tokyo
- ✓ Number of papers: 28 (Special invited talks: 2, Invited talks: 4, Invited Lectures: 2, Panel discussion: 2, and Regular talks: 18)
- ✓ Number of participants: 437

### General Session

The workshop on mobile communication has convened by multi-technical committees every years. In this year, RCS, SRW, and CCS co-hosted, and IEEE VTS Japan Chapter co-sponsored with SR. The general session had 18 presentations. Their technical fields are listed as follows:

- Spectrum sensing and detection of radio system
- Co-existence method for 5G
- Frame collision detection in spectrum sharing
- Energy harvesting
- Implementation
- Synchronization
- Measurement of channel occupancy ratio

### Panel Discussion: “Visualization for radio signals”

The panel discussion has 5 panelists and was co-hosted by SR and SRW. The panelists are listed as follows:

- Prof. Takeo Fujii (The Univ. of Electro-Comm.)
- Dr. Kazuhiro Uehara (NTT)
- Dr. Masafumi Katoh (FUJITSU Labs)
- Dr. Yukiko Kishiki (KKE)
- Prof. Hiroshi Harada (Kyoto Univ.)

### Invited Lectures (TCSR Organized Session)

The invited speakers and topics of presentation are listed as follows:

- Dr. Kazuaki Takahashi (Panasonic), “Latest trends for 60 GHz band multi-gigabit wireless technology and standardization - IEEE802.11ad/WiGig and Next Generation 60 GHz –”
- Prof. Akihiro Nakano (The Univ. of Tokyo), “Technology Trends in SDN/NFV”

### Invited Talks (Organized Session by joint TCs)

The invited speakers and topics of presentation are listed as follows:

- Dr. Yusuke Asai (NTT), “Overview of Standardization for IEEE 802.11 High Speed Wireless LAN Systems”
- Dr. Iwao Hosako (NICT), “Research and development in Japan, Europe and USA, and the current state of standardization for realization of 100 Gbit/s radio system”
- Prof. Naoki Wakamiya, “All impulse wireless sensor network”

- Dr. Takaharu Nakamura (FUJITSU), “Radio access technologies towards the fifth generation mobile communications system - Research activities of The Fifth Generation Mobile Communication Promotion Forum -”

### ***Special Invited Talks (Fig. 5)***

The invited speakers and topics of presentation are listed as follows:

- Prof. Shuzo Kato (Tohoku Univ.), “Goal of Engineering Education in Global Competition Era – Suggestions from 38-year experience in industry and academia, in Japan and USA –”
- Prof. Hiroshi Suzuki (Tokyo Inst. Tech),” A Note on The Evolution of Mobile Radio Technologies”



Fig. 5 Special invited talks from retiring professors at March conference

### ***Technical Exhibitions***

The TCSR presented a poster on summary of SmartCom 2014 as the first challenging trial towards its international activities.

### **3 Remarkable Plans: SmartCom 2015 and 2016**

SmartCom 2015 will be held on 26<sup>th</sup> – 27<sup>th</sup> October 2015 at Kozo Keikaku Engineering Inc. located in Tokyo. Researchers outside of Japan are invited for tutorials and special talks to update the latest trends and knowledge of radio technologies in the world. Technical/product exhibition session and poster session are planned to be organized. It is expected that a session on mili-meter wave technologies are also organized. SmartCom 2016 is planned to be held on 16<sup>th</sup> – 17<sup>th</sup> May 2016 in Oulu, Finland, which is now discussed by TCSR and local organizers.

Both the conferences will have invited talks given by local organizers and excellent presenters of SmartCom previously held. This type of feedback is expected to contribute to connect them over the world aiming at potential collaborations.

### **4 Conclusions**

One year has passed after the TCSR renamed from Software Radio to Smart Radio. During this year, TCSR has explored new international activities outside of Japan and SmartCom 2014 was successfully held in Singapore. It is remarkable that the SmartCom 2014 recorded the highest number of paper submissions since TCSR was launched. Also, TCSR step into

investigations on new frontiers including 5G system, SDN and dynamic spectrum access technologies.

TCSR will try to steadily implement its new missions of globalization, sustainable development of technical fields and encouragement of new young human resource. All those who are interested in TCSR activities are all welcome to join it.

### **5 References**

- [1] K. Sakaguchi, et al., “Technical Committee on Smart Radio - A new stage for advancing the frontiers of wireless communications technology -,” IEICE Communications Society, Global News Letter, Vol. 38, No. 3, Sep. 2014.

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

**Contact email** : [sr\\_ac-sec@mail.ieice.org](mailto:sr_ac-sec@mail.ieice.org)

## Report on IBP 2015

Arief Hamdani Gunawan  
Telkom Indonesia



2015 IEEE International Broadband and Photonics Conference (IBP 2015) international event in designed for audience working in broadband communications and photonics technologies communities is conducted successfully in Bali, 23-25 April 2015. As the international conference focusing on broadband and photonics technologies, IBP is very suitable for photonics and broadband researchers, industry professionals, and academics interested in the latest topics of development and design of broadband and photonics. The top three most favorable topics in IBP 2015 are:

- Networks: 12 papers
- Optical Devices: 11 papers
- Optical Receivers and Sensors: 10 papers

Sponsored by the IEEE Communications Society Indonesia Chapter, IBP has a strong foundation of bringing together industry and academia worldwide. The top three highest numbers of authors in papers submission are

- Malaysia: 70 authors
- Japan: 17 authors
- India: 16 authors

Moreover, through IEEE Photonics Society and IEICE Communications Society as technical co sponsor, IBP 2015 provides very high quality papers in broadband and photonics with 48.9% acceptance ratio.

IBP 2015 also present very high quality keynotes, there are “Enabling Technologies for Future Sustainable Optical Network” presented by Dr. Tetsuya Miyazaki, Director General of Photonic Network Research Institute, National Institute of Information and Communications Technology (NICT) and “OTT-TV and broadband development in APAC Territories” presented by Dr. John Kjellemo, Technical Director Advanced Solutions APAC, Conax Asia-Pacific.

IBP also would like to deliver high appreciation to The Optical Society (OSA), Optical Networking Technical Committee (ONTC), Communications Society (COMSOC), NICT, and Himpunan Optika Indonesia/Indonesian Optical Society (HOI/InOS) that supported IBP 2015. IBP 2015 also say many thanks to 145 authors that are involved in papers submission and 178 TPC members that are provided high quality reviews.

We hope all of broadband and photonics scholars, researchers, engineers and communities able to support IBP 2016 that will be held on April 2016 in Bandung, Indonesia. Please kindly visit [www.ibp-conf.org](http://www.ibp-conf.org) for the update.



Fig. 1 Photo of IBP 2015 - A



Fig. 2 Photo of IBP 2015 - B

# Report on the 9<sup>th</sup> International Symposium on Medical Information and Communication Technology (ISMICT 2015)

\*Daisuke Anzai, \*\*Kohei Ohno

\*Vice Chair of ISMICT 2015 Technical Program Committee

\*\*Vice Chair of ISMICT 2015 Organizing Committee



## 1. Introduction

The 9<sup>th</sup> International Symposium on Medical Information and Communication Technology (ISMICT 2015) was held at Shonan Village Center, Kamakura, Kanagawa, from March 24<sup>th</sup> to 26<sup>th</sup>, 2015. This symposium was co-sponsored by Yokohama National University and Centre for Wireless Communications (CWC) NIPPON. Additionally, it was technically co-sponsored by the IEEE Engineering in Medicine and Biology Society (IEEE EMBS), IEICE Technical Committee on Healthcare and Medical Information Communication Technology (IEICE TC-MICT), National Institute of Information and Communications Technology (NICT), and Japanese Society for Medical and Biological Engineering (JSMBE).

## 2. Organization

The organizing committee of ISMICT 2015 was formed with the Honorary Chair Prof. Ryuji Kohno (Yokohama National Univ., Japan) and the General Co-Chairs; Dr. Art Astrin (Astrin Radio, USA), Prof. Shinsuke Hara (Osaka City Univ., Japan), Prof. Jari Iinatti (Univ. Oulu, Finland) and Prof. Jianqing Wang (Nagoya Inst. Tech., Japan).

## 3. Conference Program

The symposium presentations started with the opening ceremony, which consists of the opening address by the General Chair Prof. Shinsuke Hara (Fig. 1) and the celebration speech of cosponsors representative by Kanagawa Prefecture Deputy Governor Mr. Shinji Yoshikawa. During ISMICT 2015, we had 61 presentations with about 110 participants from more than 10 countries of the world, such as Japan, Finland, Australia, Canada, and so on. With regard to the technical sessions, there were 9 regular and 2 special sessions as follows:

- Antennas and Propagation in Body Area Networks I & II
- PHY Technologies for Body Area Networks I & II
- MAC Technologies for Body Area Networks
- Health-Care Systems and Applications
- e-Health and Medical Information Systems
- BAN Applications
- Sensing and Signal Processing Techniques for Medical Healthcare Applications
- [Special Session] ETSI SmartBAN
- [Special Session] EMC



Fig. 1 Opening address by General Chair Prof. Shinsuke Hara



Fig. 2 Keynote address by Dr. Maritta Perala-Heape



Fig. 3 Keynote address by Dr. Toru Watsuji

This symposium, expect for the regular and special sessions, also included keynote speakers from Finland and Japan presenting overviews of current research in important areas:

- Dr. Maritta Perala-Heape (Univ. Oulu, Finland.)  
“The digital health Revolution” (Fig. 2)



(a) Coordinator Prof. Ryuji Kohno



(b) Panelists

Fig. 4 Panel presentation and discussion of international workshop on MDRS 2015

- Dr. Toru Watsuji (Sharp Corporation, Japan) “The Current State of Digital Healthcare Towards Medical ICT” (Fig. 3)

#### 4. Tutorial Organized by IEICE TC-MICT

As a coalesced event of the symposium, IEICE TC-MICT organized one tutorial “Tutorial on Healthcare and Medical Information Communication Technology” on the first day of ISMICT 2015 with 3 interesting talks:

- Dr. Masaru Sugimachi (National Cerebral and Cardiovascular Center, Japan) “Needs to Evaluate and Optimize MICT Application to Best Impact on Medical Outcome”
- Dr. Huan-Bang Li (NICT, Japan) “Modulation Schemes for Body Area Networks”
- Dr. Matti Hamalainen (Univ. of Oulu, Finland) “UWB On-Body Radio Channel Modeling”

#### 5. International Workshop on Medical Device Regulatory Science “MDRS 2015”

On the second day of the symposium, an international workshop on Medical Device Regulatory Science “MDRS 2015” was held by Kanagawa Medical Device Regulatory Science Center. This workshop had two keynote addresses given by Dr. Ms. Noora Jansson (Director, Oulu Health, Business Oulu, Finland) and Dr. Kazuhiro Shigetoh, (M.D., M.P.H., Ph.D., Executive Director, PMDA, Japan). After the keynote addresses, a panel presentation was organized by the coordinator Prof. Ryuji Kohno (Yokohama National Univ.) together with the following panelists (Fig. 4):

- Prof. Dennis Templeton (M.D., M.P. Ph.D., UAE University, Al Ain, UAE)
- Dr. Ms. Noora Jansson (Oulu Health, Business Oulu, Finland)



Fig. 5 General Chairs and TPC Chairs in Banquet at Kamakura Prince Hotel



Fig. 6 Winners of “Best Student Paper Award” and TPC Chairs

- Dr. Kazuhiro Shigetoh (M.D., M.P.H., Ph.D., Executive Director, PMDA, Japan)
- Prof. Lorenzo Mucchi (Univ. Florence, Italy)
- Dr. Hiroaki Hagiwara (M.D., Ph.D., Yokohama Minami Kyosai Hospital, Japan)
- Mr. Elie Salim Aad (Manager, M2M Division, Etisalat, Abu Dhabi, United Arab Emirates)

#### 6. Best Student Paper Award

The technical program committee selected the following two student authors as winners of “Best Student Paper Award”:

- Mr. Hasnain Virk (Univ. Oulu, Finland) “Stochastic Spectral Occupancy Modeling: A Body Area Network Perspective in ISM Band”
- Mr. Takahiro Ito (Nagoya Inst. Tech., Japan), “Performance Comparison Between TOA- And RSSI-Based Localization Methods for Wireless Capsule Endoscopy Systems”

The award ceremony was held in the banquet at the second night of the symposium (Figs. 5 and 6).

#### 7. Conclusion

We believe that ISMICT 2015 was a really successful symposium for all participants. On behalf of the organizing committee, we would like to thank all of the authors, the committee members and the financial sponsors for their contribution to the great success of ISMICT 2015.

I would like to announce with great pleasure that the next symposium ISMICT 2016 will be held on March 21<sup>st</sup> to 23<sup>rd</sup>, 2016, in Worcester Polytechnic Institute, Massachusetts, United States (for more details, please visit <http://www.cwins.wpi.edu/ismict16/index.html>)

# Report on ISADS 2015

Xiaodong Lu  
Electronic Navigation Research Institute



## 1. Introduction

The Twelfth International Symposium on Autonomous Decentralized Systems (ISADS) was held in Taichung, Taiwan, from March 25<sup>th</sup> to 27<sup>th</sup>, 2015. The ISADS 2015 was sponsored by the Computer Society of the Institute of Electrical and Electric Engineers (IEEE) and in cooperation with the Institute of Electronics, Information and Communication Engineers (IEICE) Communications Society, IEICE Information and Systems Society, International Federation of Automatic Control (IFAC), International Federation for Information Processing (IFIP), and Object Management Group (OMG) [1, 2].

The first ISADS was held in Kawasaki, Japan in 1993, and the concept of Autonomous Decentralized Systems (ADS) was well recognized. The ADS technologies have been expanded in the past 22 years from the computing, communication, and control technologies to the innovative integration of these technologies and their applications, which are more closely related to our daily-life.

The special topic of ISADS 2015 is the evolving systems for next generation social infrastructures, which bring the future technologies and global applications for the discussions. The General Chair, President of Asia University, Prof. Jeff Tsai gave an opening remark (Fig. 1).



Fig. 1 Opening remark by General Chair Prof. Jeff Tsai

## 2. Program

In ISADS 2015, Forum, two keynotes, four regular sessions, four workshops, a student session and social events were organized.

### 2.1 Forum

At the Tenth Jubilee ISADS 2011, the first Forum on “Paradigm Shift of Research and Development for Information Technology under Changing and Unpredictable Market” was founded. The Forum Organization Committee Chair and Steering Committee Chair Prof. Kinji Mori gave an introduction of this Forum (Fig. 2). Society, economy and life have been unpredictably changing and evolving under the globalization, while a new value of sustainability has been more important as well as in growth. Technology and business are more and more rapidly and mutually related in the real world, and then the consistency of their research and development is crucial for sustainability in manufacturing, operation, maintenance and service in all life-cycle of system. Then ADS was recognized to be the key for the paradigm shift for research and development in Information Technology and it was published by Wiley in 2014 [3]. Since 2011, the forums have been organized in ISADS.



Fig. 2 Forum introduction by Steering Committee Chair Prof. Kinji Mori

To achieve the sustainable evolution through concept-oriented research and development approaches, ISADS 2015 Forum focused on the topic of “Concept-oriented Transformation” that society, industry and life can appropriately transform themselves from an old stage to a new one in their life cycle. During forum, seven invited speakers from Japan, Taiwan, USA and Europe gave their speeches:

- Gaku Suzuki (Hitachi Ltd., Japan), “Operator-Oriented Manufacturing: Railway Transportation Transformation toward Social”

- Jeff Tsai (Asia University, Taiwan), “An integrated systems biology approach for biological systems”
- Farokh Bastani (University of Texas, Dallas, USA), “Emerging Technologies for Disaster Management and Prevention”
- Masaki Ogata (East Japan Railway, Japan), “Innovation of Management and Technology in railway industry as social infrastructure can make higher Quality of Life”
- W. T. Tsai (Arizona State University, USA), “ADS Technologies in modern computing infrastructure”
- Radu Popescu Zeletin (Technical University of Berlin, Germany), “Internet of Things for Smart Cities”
- Colin Harrison (IBM, USA), “Natural Disaster Resilience”

## 2.2 Technical Sessions

ISADS 2015 had four regular sessions on Web and Cloud-Based Systems, Dependability and Performance, Distributed and Network Systems, and Industry Applications. In addition, ISADS organized two keynotes on the topic of Big Data and its applications:

- Prof. Yi-Bing Lin (Deputy minister of science and technology, Taiwan and IEEE and ACM Fellow), “Big Data and Potential Government Applications”
- Prof. Lionel M. Ni (University of Macau, China), “What Is the Big Idea behind the Big Data?”

ISADS 2015 also hosted four workshops:

- International Workshop on Agile Decentralized Resilient Operation of Internet of Things Systems
- International Workshop on Systems and Algorithms for Distributed Embedded Intelligence
- International Workshop on Service Assurance in System Wide Information Management
- International Workshop on Smart Grid Communications and Networking

To encourage students to present their ongoing work, exchange ideas with other experts, and receive early feedback on their research work, the student session was organized and got a high evaluation (Fig. 3).



Fig. 3 Student Session

## 2.3 Social Events

The social highlight of ISAD 2015 was the Banquet & the Cultural Exchange event of ADS and TEA,

which was held on March 26<sup>th</sup> and 27<sup>th</sup> at the Splendor Hotel Taichung. More than 100 participants attended the events. The cultural exchange event, ADS and TEA was arranged not only in the Banquet but also as a special party after the conference (Fig. 4).



Fig. 4 Cultural Exchange event: ADS and TEA

There are many cultures in the world, which has succeeded for hundreds and thousands years. The culture has its original concept and it is recognized and evaluated as the value of the society. This event is to clarify the ADS concept with the analogy of the tea cultural concept, where we drink, enjoy and feel happiness through its aroma, taste and atmosphere. In this event, participants enjoyed not only the cultural exchange of ADS and TEA but also experienced the tea of Japan, UK and Taiwan (Fig. 4).

The Plant Tour to AU Optronics Corp and Museum Tour to Asia Museum of Modern Art were arranged on March 30<sup>th</sup>, 2015. More than 30 participants joined two tours.

## 3. Conclusion

ISDAS 2015 was really successful. The organization committee thanks for the contributions to the symposium of all participants, all committee members, secretaries, and staffs for their hard work. The next ISADS will be held in 2017 in Thailand. We hope more participants can join this event.

## 4. References

- [1] <http://isads2015.asia.edu.tw/index.html>
- [2] Proceedings of twelfth IEEE International Symposium on Autonomous Decentralized Systems (ISADS 2015).
- [3] Kinji Mori, “Concept-Oriented Research and Development in Information Technology,” Wiley, ISBN 978-1-118-47891-2, 2014.

# Report on the IEICE Information and Communication Technology Forum 2015

Bamidele Adebisi  
Manchester Metropolitan University



## 1. Introduction

The IEICE Information and Communication Technology Forum was held from 3<sup>rd</sup> to 5<sup>th</sup> June 2015 at Manchester Metropolitan University in Manchester, UK. The conference aimed to encourage the collaboration of researchers in academia and industry, and was attended by engineers, scientists, researchers, professors and PhD students from around the world. The focus of the 2015 IEICE ICTF was on trends in Future Communication Technologies and Applications, and the conference acted as a forum for the exchange of ideas and discussion in these and other related areas, providing a focus for future research and development.

The conference was sponsored by: The Institute of Electronics, Information and Communication Engineers (IEICE), IEICE Communications Society (IEICE-CS), IEICE Electronics Society (IEICE-ES), IEICE Europe Section and Polish Association of Telecommunication Engineers (PATE).

## 2. The conference programme

The conference began with a guided walking tour taking in the cultural and historical features of the city of Manchester, followed by a welcome luncheon. Delegates also experienced the city's culinary delights at local restaurant Zouk, for the conference dinner.

The official opening of the conference, on the following day, was chaired by Dr. Bamidele Adebisi, and started with a keynote talk from Prof. Fumiyuki Adachi of the Department of Communications Engineering, Tohoku University, Japan. Over the course of the ICTF 2015, we heard 38 presentations, with related discussions, which were attended by around 45 participants.



Fig. 1 Prof. Fumiyuki Adachi of Tohoku University giving keynote talk to open IEICE ICTF 2015

Keynote speakers attended from universities in Japan, Germany and Wales, presenting research in the following areas:

- Prof. Fumiyuki Adachi (Tohoku University) “Challenges Toward Spectrum-Energy Efficient Wireless Networks” (Fig. 1)
- Dr. Werner Prost (University of Duisburg-Essen) “Nanowires for High-Speed Nanoelectronics and Nanophotonics”
- Prof. Ifiok Otung (University of South Wales) “Beyond 5G: New thinking for truly ubiquitous ample-speed wireless communications”

The conference also featured industry speakers from Sweden and Belgium:

- Dr. Alberto G. Perotti (Huawei Technologies) “Overloaded Multiple Access for Next Generations of Wireless Communications”
- Dr. Haris Gačanin (Alcatel-Lucent Bell) “Network Optimization in 5G” (Fig. 2)



Fig. 2 Dr. Haris Gačanin giving a talk from industry

During the conference, invited speakers from as far afield as Japan, Poland and Serbia attended to present their research:

- Dr. Sinan Sinaovic, Glasgow Caledonian University, UK
- Dr. Sujun Rajbhandari, University of Oxford, UK



Fig. 3 Dr. Dejan Vukobratovic, an invited speaker

- Dr. Dejan Vukobratovic, University of Novi Sad, Serbia (Fig. 3)
- Prof. Aleksandra Pižurica, Ghent University, Belgium
- Dr. Kianoush Nazarpour, Newcastle University, UK



Fig. 4 Dr. Wasio O. Popoola, during his invited speech

- Dr. Wasio O. Popoola, University of Edinburgh, UK (Fig. 4)
- Dr. Sunday Cookey Ekpo, University of Manchester, UK
- Dr. Osamu Muta, Kyushu University, Japan
- Dr. Maciej Piechowiak, Kaimierz Wielki University, Poland
- Dr. Rupak Kharel, Manchester Metropolitan University, UK

### 3. Acknowledgments

On behalf of the Organizing Committee we would like to thank the members of the Local organizing Committee Dr Rupak Kharel, Sunday Ekpo, Augustine Ikpehai and Matjaz Rozman for their support. I would also like to thank all the authors, Technical Program Committee members and the reviewers for their contribution to the success of ICTF 2015. We would like to thank the IEICE and IEICE-CS for their financial sponsorship which ensured that the ICTF 2015 forum was open not only to the authors of the accepted papers and registered participants, but also to students.

### 4. IEICE ICTF 2016 Call For Papers

We are delighted to announce that the 2016 IEICE ICTF will be hosted by the University of Patras, in the beautiful city of Patras, Greece. The focus will be on presenting trends in Future Communication Technologies and Applications. We invite you to visit our web site for further details – <http://www.ictf2016.ieice-europe.org/>.

### 5. IEICE Transactions on Communications

This is to announce the call for paper by the *IEICE Transactions on Communications* to special section entitled “*European ICT R&D Project Activities on Broadband Access Technologies in Conjunction with Main Topics of 2015 IEICE ICT Forum*” in June 2016. For more details, please visit <http://www.ieice-europe.org/>



Fig. 5 Group picture of delegates at the ICICE ICTF 2015, hosted by Manchester Metropolitan University

# Report on Taiwan-Japan SDN/NFV Event

Katsuhiko Shimano  
NTT Network Innovation Laboratories



## 1. Introduction

Taiwan-Japan SDN/NFV event was held on May 13<sup>rd</sup> – 14<sup>th</sup>, 2015 in Hsinchu, Taiwan. IEICE Technical Committee on Network Virtualization co-hosted the event with Taiwanese organizations including Ministry of Economic Affairs' Committee of Communications Industry Development, Industrial Technology Research Institute (ITRI), and National Chiao Tung University (NCTU).

## 2. About the Event

IEICE Technical Committee on Network Virtualization holds international symposiums every year, including ones that are planned regularly, for the purpose of facilitating cooperation among researchers and engineers of the technological field.

Software Defined Networking (SDN) and Network Functions Virtualization (NFV) are attracting lots of attention in Taiwan, leading to formulation of Taiwan SDN Alliance in 2013. Recognizing that trend, a symposium was planned this year to share expertise coming from Taiwan and Japan and facilitate cooperation between the two countries' SDN/NFV communities. The symposium was held at ITRI on the first day of the event. It gathered more than 100 participants.

Along with the symposium, a tutorial and a hands-on seminar were held at NCTU on the second day. As open source software is getting increasingly important, the meetings were meant to provide an opportunity for students and young engineers to learn that kinds of software, especially ones that originated in Japan. There were about 80 attendees in the tutorial and about 40 in the hands-on seminar.

## 3. Symposium Program

The symposium started with the presentations by Prof. Nakao of the University of Tokyo (U-Tokyo) and Prof. Chen of National Taiwan University of Science and Technology (NTUSC). The two presentations surveyed each country's status, such as newest research issues and future plans.

1. Akihiro Nakao (U-Tokyo), "Current status and future of Network Virtualization Technologies"
2. Jiann-liang Chen (NTUSC), "Network Virtualization and Virtual Tenant Network"

After these introductory presentations, seven invited speaker from both the countries made presentations.

3. Satoshi Kamiya (NEC), "Introduction of SDN platform in O3 project"
4. Hitoshi Masutani (NTT), "Design and implementation of SDN Software Switch"

5. Te-Lung Liu (National Center for High-performance Computing), "TWAREN SDN Testbed and SDX"
6. Li-Ping Tung (NCTU), "SDN-enabled Cloud-based Wireless/Broadband Network Technologies & Services"
7. Dar-zu Hsu (ITRI), "The development of SDN Technology in Taiwan"
8. Masashi Kitamura (NTT), "High quality live streaming on SDN"
9. Noriyoshi Yamazaki (Okinawa Open Laboratory), "Activities of Okinawa Open Lab & Lagopus user community"

Their topics ranged from specific technical issues to newest use cases to research activities, etc. Participants seemed to have much interests as they made discussions actively in the Q&A sessions.



Fig. 1 Symposium session

## 4. Tutorial and Hands-on Seminar Program

The tutorial was held in the morning. Prof. Nakao first explained concepts and technologies used in network virtualization and then provided specifics about the FLARE system as an example of implementation as well as its future development plans.

In the hands-on seminar, held in the afternoon, two software products coming from O3 Project, a Japan-based joint research project, were introduced: an SDN software switch "Lagopus" and an SDN platform "ODENOS." Participants learned installation of the software and actual usages on their own PCs.

## 5. Conclusion

The two-day event proved to be a good opportunity to stimulate interaction between engineers and researchers of the two countries. This move should be enhanced even further to advance the technology through cooperation.

### IEICE-CS Related Conferences Calendar

| Date                      | Conference Name   | Location              | Note                             |
|---------------------------|---|-----------------------|----------------------------------|
| 22 Nov. -<br>25 Nov. 2015 | 4 <sup>th</sup> International Conference on Renewable Energy Research and Applications ( <b>ICRERA2015</b> )                                | Palermo, Italy        | To be held <b>soon</b>           |
| 17 Nov. -<br>19 Nov. 2015 | The 4 <sup>th</sup> ENRI International Workshop on ATM/CNS ( <b>EIWAC2015</b> )   | Tokyo, Japan          | To be held <b>soon</b>           |
| 9 Nov. -<br>12 Nov. 2015  | 2015 International Symposium on Antennas and Propagation ( <b>ISAP2015</b> )  | Tasmania, Australia   | To be held <b>soon</b>           |
| 18 Oct. -<br>22 Oct. 2015 | 37 <sup>th</sup> IEEE International Telecommunication Energy Conference ( <b>INTELEC 2015</b> )   | Osaka, Japan          | To be held <b>soon</b>           |
| 14 Oct. -<br>16 Oct. 2015 | The 21 <sup>st</sup> Asia-Pacific Conference on Communications ( <b>APCC2015</b> )  | Kyoto, Japan          | To be held <b>soon</b>           |
| 4 Aug. -<br>7 Aug. 2015   | 10 <sup>th</sup> Asia-Pacific Symposium on Information and Telecommunication Technologies ( <b>APSITT2015</b> )                             | Colombo,<br>Sri Lanka | Done                             |
| 13 Jul. -<br>15 Jul. 2015 | International Symposium on Ultrafast Photonic Technologies and Extremely Advanced Transmission Technologies 2015 ( <b>ISUPT/EXAT 2015</b> ) | Kyoto, Japan          | Done                             |
| 7 Jul. -<br>10 Jul. 2015  | International Conference on Ubiquitous and Future Networks 2015 ( <b>ICUFN 2015</b> )   | Sapporo, Japan        | Done                             |
| 28 Jun. -<br>2 Jul. 2015  | OptoElectronics and Communications Conference 2015 ( <b>OECC 2015</b> )   | Shanghai, China       | Done                             |
| 28 Jun. 2015              | OSA Advanced Photonics Congress 2015 Space-Division Multiplexing Workshop ( <b>OSA APC2015 SDM workshop</b> )                               | Boston, USA           | Done                             |
| 3 Jun. -<br>5 Jun. 2015   | 2015 IEICE Information and Communication Technology Forum ( <b>IEICE ICTF 2015</b> )  | Manchester, UK        | <b>Reported</b><br>on this issue |
| 13 May -<br>14 May 2015   | Taiwan-Japan Workshop on SDN/NFV  | Hsinchu, Taiwan       | <b>Reported</b><br>on this issue |
| 23 Apr. -<br>25 Apr. 2015 | 2015 IEEE International Broadband and Photonics Conference ( <b>IBP 2015</b> )  | Bali, Indonesia       | <b>Reported</b><br>on this issue |
| 25 Mar. -<br>27 Mar. 2015 | The Twelfth International Symposium on Autonomous Decentralized Systems ( <b>ISADS2015</b> )  | Taichung, Taiwan      | <b>Reported</b><br>on this issue |
| 24 Mar. -<br>26 Mar. 2015 | 2015 9 <sup>th</sup> International Symposium on Medical Information and Communication Technology ( <b>ISMICT2015</b> )                      | Kamakura, Japan       | <b>Reported</b><br>on this issue |

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

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

## Special Section Calendar of IEICE Transactions on Communications

| Issue     | Special Section  | Note   |
|-----------|--|--|
| Nov. 2016 | Deepening and Expanding of Information Network Science   | Submission due:<br>18 March 2016<br><b>See page 33</b>     |
| Oct. 2016 | Satellite Communication Technologies in Conjunction with Main Topics of JC-SAT2015   | Submission due:<br>12 February 2016<br><b>See page 32</b>  |
| Sep. 2016 | Integration Technologies of Ambient Intelligence and Sensor Networks   | Submission due:<br>8 January 2016<br><b>See page 31</b>    |
| Aug. 2016 | Advanced Information and Communication Technologies and Services in Conjunction with Main Topics of APCC2015                   | Submission due:<br>1 December 2015<br><b>See page 30</b>   |
| Jul. 2016 | No special section in this issue   |  |
| Jun. 2016 | European ICT R&D Project Activities on Broadband Access Technologies in Conjunction with Main Topics of 2015 IEICE ICT Forum   | To be issued   |
| May 2016  | Internet Architectures and Management Methods that Enable Flexible and Secure Deployment of Network Services                   | Submission due:<br>15 September 2015<br><b>See page 29</b> |
| Apr. 2016 | Autonomous Decentralized Systems Technologies and Applications for Next-Generation Social Infrastructure                       | To be issued   |
| Mar. 2016 | Information and Communication Technology for Healthcare and Medical Applications in Conjunction with Main Topics of ISMICT2015 | To be issued   |
| Feb. 2016 | Management for the Era of Internet of Things and Big Data  | To be issued   |
| Jan. 2016 | Recent Progress in Antennas, Propagation and Wireless Systems Related to Topics in ISAP2014                                    | To be issued   |
| Dec. 2015 | No special section in this issue   |  |
| Nov. 2015 | No special section in this issue   |  |
| Oct. 2015 | 5G Radio Access Networks [Part II] Multi-RAT Heterogeneous Networks and Smart Radio Technologies                               | To be issued <b>soon</b>                                   |
| Sep. 2015 | Emerging Technologies on Ambient Sensor Networks toward Future Generation  | To be issued <b>soon</b>                                   |
| Aug. 2015 | 5G Radio Access Networks [Part I] Radio Access Technologies and System Design  | Vol. E98-B, No.8   |
| Jul. 2015 | Electromagnetic Compatibility Technology in Conjunction with Main Topics of EMC'14/Tokyo                                       | Vol. E98-B, No.7   |
| Jun. 2015 | No special section in this issue   |  |

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

## --- Special Section on Internet Architectures and Management Methods that Enable Flexible and Secure Deployment of Network Services ---

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Internet Architectures and Management Methods that Enable Flexible and Secure Deployment of Network Services" in the **May 2016** issue.

It has attracted considerable attention to rebuild the whole Internet architecture up to the application layer based on new viewpoints, in which various levels of virtualization techniques and new concepts such as SDN and NFV are integrated with ubiquitous environments containing mobile terminals and sensor nodes. Furthermore, to make it possible to provide new network services flexibly, fundamental technologies are required for enabling safe and secure network management and dynamic deployment of network services depending on each application domain. We thus call for publications (scheduled to appear in the May 2016 issue) for promoting discussion and development of the Internet architectures and management methods for flexible and secure development of services.

### 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 new generation Internet
    - new paradigms for new generation Internet, e.g., information centric networking, delay tolerant networking, and software-defined networking
    - routing and traffic control technologies for ultra-large and complex networks, e.g., P2P networks and Internet-of-Things.
    - security technologies for multi-domain environment, e.g., authentication, authorization and accounting mechanisms for cloud/grid computing, intrusion detection, and prevention against DDOS.
  - \* Network management methods and operation experiences for new generation Internet
    - network management methods based on new schemes, e.g., ontology and cross-layer collaboration.
    - guidelines according to trustworthiness, quality evaluation methods, and services
  - \* Other technologies for new generation Internet
    - mobility support mechanisms
    - scalable QoS support mechanisms
- etc.

### 2. Submission Instructions

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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](https://review.ieice.org/regist/regist_baseinfo_e.aspx) by **September 15, 2015 (JST)**. Authors should choose the Internet Architectures and Management Methods that Enable Flexible and Secure Deployment of Network Services as a "Journal/Section" on the online screen. Do not choose [Regular EB].

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### 3. Special Section Editorial Committee

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

## Call for Papers

# ----- Special Section on Advanced Information and Communication Technologies and Services in Conjunction with Main Topics of APCC2015 -----

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Advanced Information and Communication Technologies and Services in Conjunction with Main Topics of APCC2015" in the **August 2016** issue.

While globalization progresses beyond the border, the importance of the role of the Asia-Pacific region has been increasing more and more in the development of telecommunications technology. Under such circumstances, APCC (Asia-Pacific Conference on Communications) is held every year for the purpose of providing an opportunity to young researchers and students of the telecommunications sector in the Asia-Pacific region countries to present their research achievements, exchange future views and opinions, and promote people-to-people exchanges among researchers. We also have contributed to improve the level of advanced research. In conjunction with the opportunity of APCC2015 organized by the IEICE Communications Society, special section is being planned (scheduled to appear in the August 2016 issue). We prospect for the future outlook the state-of-the-art telecommunications technology and further promote research and development of the information and communication technologies and services in the Asia-Pacific region. The special section solicits paper submission particularly from, but not restricted to, researchers who presented their original works in APCC2015.

### 1. Scope

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

- (1) Wireless communication technologies  
4G/5G mobile networks, Broadband wireless access, WLAN/WPAN, Cognitive radio, Software radio, Antennas and propagations, Satellite and space communications
- (2) Optical communication technologies  
Optical fiber, Optical communication system, Photonic network
- (3) Network technologies  
Social networks, Network and service management, Overlay networks, M2M/P2P networks, Software defined networks
- (4) Fundamental technologies for communication  
Green communications, Advanced modulation and coding, Speech and video signal processing, Information and communication theory, Broadcasting technologies

### 2. Submission Instructions

The standard number of pages is 8. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guideline in the "Information for Authors." The latest version is available at the web site, [http://www.ieice.org/eng/shiori/mokuji\\_cs.html](http://www.ieice.org/eng/shiori/mokuji_cs.html). The 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](https://review.ieice.org/regist/regist_baseinfo_e.aspx) by **December 1st, 2015 (JST)**. Authors should choose the Advanced Information and Communication Technologies and Services in Conjunction with Main Topics of APCC2015 as a "Journal/Section" on the online screen. Do not choose [Regular EB].

#### Contact point:

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**Guest Editors:** Jin Mitsugi (Keio Univ.), Kei Sakaguchi (Tokyo Inst. of Tech.)

**Guest Associate Editors:** Yukitoshi Sanada (Keio Univ.), Ryo Yamamoto (Univ. of Electro-Communications), Takahiro Iyama (NTT DOCOMO), Ken-ichi Baba (Kogakuin Univ.), Tetsushi Ikegami (Meiji Univ.), Shoichiro Oda (Fujitsu), Daisuke Umehara (Kyoto Inst. of Tech.), Makoto Tsubokawa (Waseda Univ.), Toru Hasegawa (Osaka Univ.), Kanshiro Kashiki (KDDI R&D Labs.), Yoshiaki Kitaguchi (Kanazawa Univ.)

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## Call for Papers

### --- Special Section on Integration Technologies of Ambient Intelligence and Sensor Networks ---

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Integration Technologies of Ambient Intelligence and Sensor Networks" in the **September 2016** issue.

Sensor networks enable gathering ambient information from peoples, products, and sensing devices for real space. Sensing data should be processed, analyzed, and applied for enhancement or assistance for human activities, which is called ambient intelligence. Ambient sensor networks (ASNs) are the sensor networks interactively cooperating with ambient intelligence. It is expected that gentle social environments such as efficient electric power usage in smart grids and effective transportation systems will be established through the ambient sensor networks. Applied researches have been promoted in the field of technologies supporting the ambient sensor networks. Toward future generation, it is important to support such progressing technologies and promote further collaboration with other fields. From the above points of view, the special section is planned (scheduled to appear in the September 2015 issue) to publish papers on the related fields.

#### 1. Scope

The scope of this special section includes not only information and communication research fields but also its multidisciplinary research with agriculture, forestry and fisheries industry fields, industry fields including incineration and power-generator plants, and service fields such as health-care, medical-care, and circulations because they are important and major applications for the ASNs. Possible topics include, but are not limited to:

- Space sensing, vital sensing, mobile sensing, participatory sensing, cloud sensing ambient interface, device and appliance technologies, embedded software, sensing and control theory, long distance communication, 5G, millimeter wave communication, near field radio communication.
- MAC/routing protocols, QoS control, multi-hop and cooperative communication, security, cross layer design, energy harvesting, green wireless, communication and network theory.
- Sensor database, context extraction, mining, location-information technology, stream processing, privacy and security, big data, learning signal processing.
- Large scale widening, dependability, cyber physical, operation management, autonomous distributed control.
- Interdisciplinary system applications  
Agriculture, forestry and fishery support systems, disaster prevention and mitigation system, smart space, medical and health systems, industrial support system, social infrastructure system, wide area sensing system

#### 2. Submission Instructions

The standard number of pages is 8. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guideline in the "Information for Authors." The latest version is available at the web site, [http://www.ieice.org/eng/shiori/mokuji\\_cs.html](http://www.ieice.org/eng/shiori/mokuji_cs.html). The 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](https://review.ieice.org/regist/regist_baseinfo_e.aspx) by January 8, 2016 (JST). Authors should choose the Special Section on Integration Technologies of Ambient Intelligence and Sensor Networks as a "Journal/Section" on the online screen. Do not choose [Regular EB].

#### Contact point:

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#### 3. Special Section Editorial Committee

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**Guest Associate Editors:** Susumu Takeuchi (NTT), Hideyuki Kawashima (Univ. of Tsukuba), Masayuki Iwai (Tokyo Denki Univ.), Zhang Bing (NICT), Shunsuke Saruwatari (Shizuoka Univ.), Hiroaki Morino (Shibaura Institute of Technology), Shuichi Igarashi (Hitachi), Kiyohito Yoshihara (KDDI R&D Lab.), Masahiro Watanabe (Tokyo Univ. of Technology), Jin Mitsugi (Keio Univ.)

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## Call for Papers

### ----- Special Section on Satellite Communication Technologies in Conjunction with Main Topics of JC-SAT2015 -----

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Satellite Communication Technologies in Conjunction with Main Topics of JC-SAT2015" in the October 2016 issue.

The JC-SAT(Japan-Korea Joint Conference on Satellite Communications) has been held in Japan or Korea from the year of 2000, which intends to provide a forum for researchers in satellite telecommunications field to discuss the current status, technical challenges, standards, fundamental issues, future services, and applications. This conference covers technologies and system implementations of satellite communications as they relate to the areas of fixed, mobile and broadcasting satellite services. This year, the JC-SAT2015 was held in Osaka, Japan on Oct. 7-8, 2015.

By taking this opportunity the Special Section on Satellite Communication Technologies in Conjunction with Main Topics of JC-SAT2015 has been planned to publish articles which are based on the papers presented in the previous JC-SAT including JC-SAT2015. The special section does not limit the submission from the authors of the JC-SAT, and will also receive the submission of the papers on the research which correspond topics of the JC-SAT.

Your contribution to this special section would be greatly appreciated.

#### 1. Scope

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

- Satellite communications (fixed-satellite communications, mobile satellite communications, inter-satellite communications, and deep space communications)
- Satellite broadcasting (BS, mobile broadcasting)
- Satellite-ground integrated communications system
- Satellite sensor network
- Unmanned aircraft communications system
- Others on the elementary technologies, the system technologies, and the applications concerning the above topics.

#### 2. Submission Instructions

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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](https://review.ieice.org/regist/regist_baseinfo_e.aspx) by **February 12, 2016 (JST)**. Authors should choose the [Special-EB] Special Section on Satellite Communication Technologies in Conjunction with Main Topics of JC-SAT2015 as a "Journal/Section" on the online screen. Do not choose [Regular EB].

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#### 3. Special Section Editorial Committee

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**Guest Editors:** Amane Miura (NICT), Fumihito Yamashita (NTT)

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## Call for Papers

### ----- Special Section on Deepening and Expanding of Information Network Science -----

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Deepening and Expanding of Information Network Science" in the **November 2016** issue.

Information networking technologies have been achieving tremendous growth as an indispensable infrastructure in our society. In particular, the recent advances in chip technology have required us to redefine the real world management of massive systems, which might be also complex and presumably made up with a variety of component devices, such as the Internet of Things. However, it is almost impossible to manage and control overall behavior of the whole system merely by knowing and assuming the behavior of its subsystems, such as independent devices or communication protocols being used in the network. Therefore, it is a sort of "recursive" approach that is quite essential for the real world implementation of the next generation networks. In this scenario, we first deepen the academic frameworks themselves for better explaining the onset of nontrivial behavior at macroscopic levels. Then, by applying such frameworks to our system, we reconsider and improve every specification for the components of the network to benefit its system performance, stability, or robustness. For this purpose, we encourage not only multidisciplinary studies around information communication technologies but also a wider spectrum of academic approaches including mathematical engineering, theoretical physics, biological system engineering, computer science, and applied mathematics, etc. Longer or extended version of the works that have been presented at the Korea-Japan Joint Workshop on Complex Communications Sciences (KJCCS2016) will be also welcomed as the submissions. We are thus planning to publish a special section (scheduled to appear in the November 2016 issue) to further promote research and development of progress in information network science.

#### 1. Scope

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

- deepening and expanding the frameworks for information network science
- theory of information network as complex systems, or applications to multimedia communication
- novel modeling, performance measure, analyzing methods for information network or multimedia communication
- theory and/or application of network information theory, such as network coding
- theory and/or application of techniques in multimedia communication to information network
- theory of nature-inspired information networking
- theory and/or application of information networking as social networks
- physical systems and devices inspired by network science
- novel network analysis method based on computer science and applied mathematics
- theory and/or application of very large-scale systems including Internet of Things (IoT)
- novel approach to information networks, such as information geometry and statistical mechanics

#### 2. Submission Instructions

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

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| <b>B</b><br>(Communications)  | EB (English)<br>B (Japanese) | Fundamental Theories for Communications, Devices/Circuits for Communications, Transmission Systems and Transmission Equipment for Communications, Optical Fiber for Communications, Fiber-Optic Transmission for Communications, Switching for Communications, Switching for Mobile Communications, Network, Network Management/Operation, Internet, Wireless Communication Technologies, Terrestrial Radio Communications, Satellite Communications, Optical Wireless Communications, Antennas and Propagation, Electromagnetic Compatibility (EMC), Sensing, Navigation, Guidance and Control Systems, Energy in Electronics Communications, Terminals for Communications, Multimedia Systems for Communications, Broadcast Systems, Integrated Systems for Communications, Space Utilization Systems for Communications   |
| <b>C</b><br>(Electronics)   | EC (English)<br>C (Japanese) | Electromagnetic Theory, Lasers, Quantum Electronics, Optoelectronics, Microwaves, Millimeter-Waves, Ultrasonic Electronics, Electronic Circuits, Electronic Materials, Organic Molecular Electronics, Electronic Components, Electromechanical Devices and Components, Semiconductor Materials and Devices, Integrated Electronics, Electron Tubes, Vacuum and Beam Technology, Electronic Displays, Superconducting Electronics, Storage Technology, Electronic Instrumentation and Control   |
| <b>D</b><br>(Information and Systems)   | ED (English)<br>D (Japanese) | Computation and Computational Models, Automata and Formal Language Theory, Algorithm Theory, Complexity Theory, Computer Components, VLSI Systems, Computer Systems, Fundamentals of Software and Theory of Programs, System Programs, Software Engineering, Database, Contents Technology and Web Information Systems, Data Mining, Networks, Dependable Computing, Application Information Security, Distributed Cooperation and Agents, Artificial Intelligence and Cognitive Science, Human-computer Interaction, Office Information Systems, e-Business Modeling, Educational Technology, Rehabilitation Engineering and Assistive Technology, Pattern Recognition, Speech and Hearing, Image Processing and Video Processing, Image Recognition, Computer Vision, Computer Graphics, Multimedia Pattern Processing, Natural Language Processing, Biocybernetics, Neurocomputing, Biological Engineering, Music Information Processing, Kansei Information Processing, Affective Information Processing |
| <b>Journal of IEICE (written in Japanese only)</b>                              |                              |  |

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

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 Female  
 Prof.  Dr.  Mr.  Ms. **Place of birth:** \_\_\_\_\_ **Date of birth:** \_\_\_\_\_  
 Day \_\_\_\_\_ Month \_\_\_\_\_ Year \_\_\_\_\_

### Mailing Address

Home  Office

Name of Company/School/College \_\_\_\_\_ Department/Section \_\_\_\_\_  
 Street \_\_\_\_\_ City \_\_\_\_\_ State/Province \_\_\_\_\_  
 Postal code \_\_\_\_\_ Country \_\_\_\_\_  
 TEL \_\_\_\_\_ FAX \_\_\_\_\_ E-mail \_\_\_\_\_

### Academic Background

The highest academic degree:  Ph.D.  Masters  Bachelors  Others: \_\_\_\_\_

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

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

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 Year \_\_\_\_\_ Month \_\_\_\_\_

### Endorsement

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

I recommend this applicant for IEICE membership.

Endorser's name \_\_\_\_\_ Membership number \_\_\_\_\_ Endorser's signature \_\_\_\_\_ Date \_\_\_\_\_

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

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

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

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

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

**Sister Society membership information**

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

Sister Society:     IEEE ComSoc         KICS         VDE-ITG

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

Copy of Membership certificate or Membership card:

(Attached here)



## IEICE Communications Society - GLOBAL NEWSLETTER Submission Guideline

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

### 1. About GLOBAL NEWSLETTER

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

#### 1.1. Goal

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

#### 1.2 Category of Articles

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

### 2. Major notes for Contribution

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

#### 2.1 Template and Language

Please use template downloadable at the URL:  
[http://www.ieice.org/cs/pub/global\\_howto.html](http://www.ieice.org/cs/pub/global_howto.html)  
Please use English for all articles.

#### 2.2 Number of pages

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

### 3. Copyright

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

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

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

#### 4. Publication fee / Manuscript fee

No publication fee and no manuscript fee for all articles.

#### 5. Schedule

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

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

##### 5.1 Call for Newsletters

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

##### 5.2 Contribution Entry

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

E-mail: [cs-gnl@mail.ieice.org](mailto:cs-gnl@mail.ieice.org)

##### 5.3 Submission of Manuscript

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

E-mail: [cs-gnl@mail.ieice.org](mailto:cs-gnl@mail.ieice.org)

##### 5.4 Submission of COPYRIGHT TRANSFER FORM

COPYRIGHT TRANSFER FORM can be downloaded at:

[http://www.ieice.org/cs/pub/global\\_howto.html](http://www.ieice.org/cs/pub/global_howto.html)

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

- By email.
- By facsimile.

Address to send:

- In case of email: [cs-gnl@mail.ieice.org](mailto:cs-gnl@mail.ieice.org)
- In case of facsimile:

Name: Publications Department, IEICE

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

#### 6 Contact Point

IEICE-CS Directors, Planning and Members Activities in charge of IEICE-CS GLOBAL NEWSLETTER, [cs-gnl@mail.ieice.org](mailto:cs-gnl@mail.ieice.org)

## From Editor's Desk

### ● IEICE Society Conference 2015 Held in September in Miyagi

As you know, at 11th March 2011, there was the huge earthquake of magnitude 9.0, the largest quake in Japanese recorded history. At that time, IEICE had cancelled general conference which had been planned to hold from 14th March 2011 in Tokyo. The center of the earthquake was in Pacific Ocean near, about 70km east, from Sendai, Miyagi prefecture. Although there was big damage in Miyagi, after that it has rapidly been recovered by a lot of effort (Note: The recovery process has not been finished yet, and is still going on). And this is the first IEICE society conference held in Tohoku area since that. All participants of society conference will be able surely to see the beautiful and comfortable city of Sendai, Miyagi. We would like to remind readers to consider joining in the conference. 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](http://www.toyoag.co.jp/ieice/E_S_top/e_s_top.html)

### ● A New Member of Editorial Staff Joined

A new member joined the editorial staff in May this year and has been engaged in publication operations from this issue. Through the publication of GLOBAL NEWSLETTER (GNL), we, three of editorial staff, are continuously trying to aim at the goal to share information between overseas/foreign members and other members in IEICE-CS as a global activity, and also to show IEICE presence internationally. For such goal, we welcome your contribution of article submissions to GNL. Category of the articles in GNL includes also Essays, Laboratory activity reports, Technology reports, Messages from overseas/foreign members, etc. For article submission, please refer to the Submission Guideline of IEICE-CS GLOBAL NEWSLETTER:

[ENG] [http://www.ieice.org/cs/pub/global\\_howto.html](http://www.ieice.org/cs/pub/global_howto.html)

[JPN] [http://www.ieice.org/cs/jpn/pub/global\\_howto.html](http://www.ieice.org/cs/jpn/pub/global_howto.html)

IEICE-CS GLOBAL NEWSLETTER Editorial Staff

#### Editorial Staff of this issue

No special order is observed



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