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## Greetings from the New President

Masahiro Umehira  
 President, IEICE Communications Society  
 Professor, Ibaraki University, Ibaraki, Japan



It is my great honor to serve as President of IEICE Communications Society (IEICE-CS), which is the largest society in IEICE where many excellent researchers and engineers from academia and industry have been actively involved in their activities. I would like to appreciate all of the past IEICE-CS officers and many volunteers involved in IEICE-CS activities. I promise to do my best to make IEICE-CS activities better and more valuable for IEICE-CS members though my term is as short as just one year.

As you may know, 2017 is the 100<sup>th</sup> anniversary of our IEICE. Supposing that the birth of electrical communications is invention of telegraph by Morse in 1836 or invention of telephone by Bell, the history of telecommunications is just 140 to 180 years. We can say IEICE has been truly advancing together with the history of telecommunications. Telecommunication technology is nowadays called ICT (Information and Communications Technology) and its advancement in these 30 years is quite amazing supported by the exponential advancement of VLSI technologies, i.e. doubled per 1.5 year as predicted by Moore's law. We can say that telecommunication technology has been million times advanced in 30 years and it will be further advancing at the same pace for 10 years. Nowadays any kind of information is digitalized and we can have an access to various services via network. Mobile phone has evolved to smart phone by which we can enjoy various services such as tele-shopping and tele-banking anytime and anywhere. Who can imagine this great advancement of ICT technologies 30 years ago? It is our great honor and also our pleasure that we have been involved in this exciting technology field and have contributed to ICT technologies.

However, this very rapid ICT technology evolution has been changing the surroundings of our IEICE-CS. In addition, there are so many other factors resulting in a big change around IEICE-CS, which include "declining birthrate and an aging population" in Japan, industrial structure change, business globalization and so on. We have to change ourselves to be more global, more open and more valuable to the members. In order to improve our activities, Task Force was established under the board of directors of IEICE, where we have been discussing strategic policies to improve IEICE activities. In IEICE-CS, we also established working groups and have been also discussing strategic policies to improve and re-activate our activities by adapting ourselves to the needs of the members for three years.

It is said that the roles of academic institute is as follows in general:

- (1) To provide the members with a place for experts to get together and to gather technical information.
- (2) To provide the members with useful information and educational opportunities.
- (3) To ensure quality of information in our transaction by peer review process for submitted papers.
- (4) To promote new technologies, to give suggestions from the expert point of view, and to explore new technical fields for future advancement.

IEICE-CS also has the same roles listed above as an academic society as well as a professional society. However, it is a curious coincidence that advancement of ICT technologies forces us to change ourselves. For example, one of the traditional roles of institutes is to publish academic journal comprising original technical papers qualified by peer review by experts. However, ICT has changed this model from paper-based journal to web-based journal using ICT technologies. Furthermore, wide spread of broadband networking, powerful search engine and SNS might replace many traditional face-to-face conference events with web-based virtual conferences, to discuss and exchange information with other experts in future. I believe we have to change our activities to adapt IEICE-CS to above-mentioned environmental changes and there are already many proposals and suggestions from the TF and WG activities. I believe the basic roles of IEICE will not be changed in future but actual activities must be changed by adaptation, otherwise we cannot survive according to the theory of evolution, i.e. who can adapt will survive.

I think there are three key issues for IEICE-CS evolution, i.e. more involvement of industry professionals, more activities for social contributions and more globalization. Regarding globalization, we should note that 10% of IEICE-CS members are overseas members. I hope utilizing ICT technologies will make it possible to be more global IEICE-CS. I know it is difficult to find a right answer to these questions without experiments, thus we should make a trial to examine and ensure which is a right evolution path. We will go forward step-by-step together with all of you to make IEICE-CS activities more valuable and more useful for your activities.

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

# World Fastest Communication from a 50 kg Class Satellite

## – Micro Satellite Hodoyoshi-4 Succeeds in 348 Mbit Per Seconds –



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### 1. Introduction

Recently technologies of small satellites have been so matured that many earth observation missions are proposed. However, it is true that small satellite missions still have limitations of satellite functions compared with large satellites. Their main limitations are earth sensing capabilities as well as down link capabilities.

The purpose of this research is to develop a high-data-rate (typically 300-500Mbps) communication system which can be applicable to small satellites of 50kg class. We have been developing the communication subsystem both for the flight hardware as well as the ground system, paying attention to reduce the DC power and the mass of onboard instruments. This system has been demonstrated on orbit using Japanese Hodoyoshi-4 Satellite launched in 2014 [1]. In December, 2014, the 3.8m antenna station at ISAS, Sagamihara received 348 Mega bit per second data with 16 QAM and successfully demodulated/decoded them without error. This communication speed is as high as a half of one of Daichi-2, a Japanese earth observation satellite with about 2 tons mass and is the world fastest as a 50kg class small satellite. This result indicates that the capability of data transmission from a small satellite approaches to capability of a large satellite. The remaining issues are the improvement of sensor capabilities compatible to a small satellite.

### 2. High Speed Communications System

#### 2.1 Problems of conventional high speed down link system

Figure 1 indicates down link data rates of low earth orbiting satellites as a function of satellite mass [2]. The figure shows that down link data rates are proportional roughly to linear or square of satellite mass. This is because in general a down link with a high data rate requires high power consumption and large mass.

Conventional communication systems of large satellites have capability of hundreds Mbps through 1Gbps and in most cases they utilize X band (8025-8400MHz) for earth observation. The maximum bandwidth is 375MHz and in most cases a convolution coding with  $r=1/2$  is applied. Therefore multiple phase-shift-keying and amplitude-phase modulation are necessary to achieve higher bit rates than 300Mbps.

These modulations, however, are sensitive to nonlinear distortion of RF power amplifiers. RF power amplifiers have to operate in linear region, which causes reduction of power efficiency. Also they require digital processing circuits with several hundred MHz clock. Space-qualified devices for these purposes require high power consumption, high cost, and special care for ball grid array (BGA) devices. Figure 2 shows power consumptions as a function of data bit rate for onboard X-band transmitters with high data rates. Their power consumptions increase as the data bit rates increase with bandwidth-effective modulations. The conventional high-data-rate communication system of large satellite requires 100W or 200W as a whole for DC power consumption.

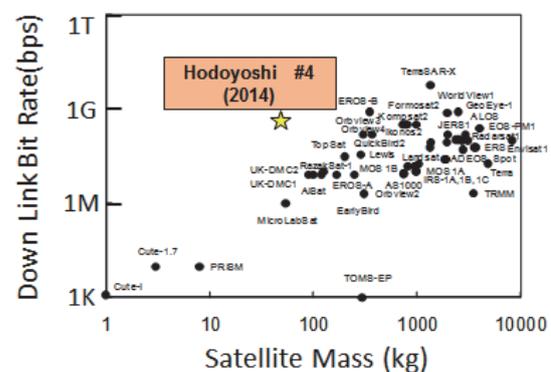


Fig. 1 Down link bit rate vs. satellite mass for low earth orbit. ★denotes our novel technology

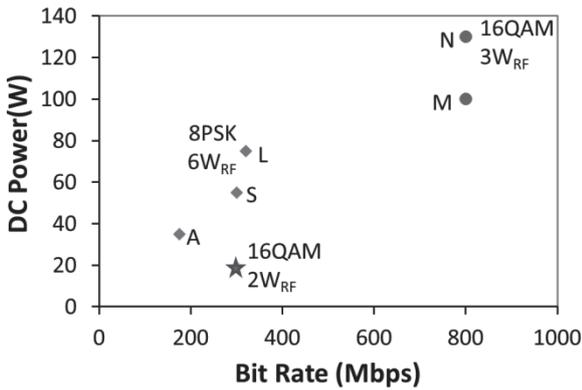


Fig. 2 DC power consumption vs. data bit rate for onboard high-data-rate transmitter. ◆ and ● correspond to conventional transmitters with 8PSK and 16QAM, respectively. ★ denotes our novel transmitter with 16QAM. RF power levels are also indicated

**2.2 Down link system for small satellite**

In this section we propose several improvements for high-data-rate down link system as described in Fig.3, including a modulation scheme, an onboard RF amplifier and a transmitter, onboard small antennas, a small S/X dual band ground station, and a high performance demodulator. Table 1 summarizes our novel communication system with high data rate for small satellites.

Consultative Committee for Space Data Systems (CCSDS) 131.2-B-1 recommendation is published to support a wide range of spectral efficiency values and rates for high-data-rate telemetry applications. Comprehensive coding and modulation schemes are defined as adaptive coding and modulation (ACM) modes including serially concatenated convolution turbo coding (SCCC) with various data rates using a punctured code and amplitude-phase shift keying (APSK).

Table 1 Performance of High-Data Rate Down Link

Instruments	Mass (g)	Power (W)	Remarks
On-board			
Transmitter	1330	20	16QAM, 348Mbps GaN Power Amp.
Antenna			
MGA	69	0	13.5 dBi
Iso-flux	150	0	5dBi(60°), -2dBi(0°)
Ground Station			
Antenna	3.8m Dia. S/X Cassegrain, 47.5dBi(X), 36dBi(S), Sys. Noise temp. 120K(X)		
Demodulator	100Msps, (348-144Mbps), 16QAM, QPSK SCCC Turbo Equalizer CCSDS 131.2-B-1		

Our symbol rate  $f_s$  is selected as 100Msps, taking into consideration the onboard digital hardware, frequency-band allocation of 150MHz, and the requirement for the data rates. We can change the data rate  $R$  (144-348Mbps) by changing the coding rate  $r$  (0.36-0.87) or ACM 1-17.

The performances of this high-data-rate downlink system shown in Fig.3 are simulated [3,4] by the signal processing work system (SPW) [5].

Let  $C$  be a received power at an input of a low noise amplifier at a ground station. Required  $C/N_0$  can be calculated as

$$\text{Required } C/N_0 = (\text{required } E_b/N_0) \times R, \quad (1)$$

where  $R$  is a bit rate given as (symbol rate)  $\times$  mod. multiplicity  $\times$  (coding rate). In this system symbol rate is 100Msps, and modulation multiplicity is 2 for QPSK and 4 for 16QAM. The required  $E_b/N_0$  is given at [6] for ideal cases. The realistic required  $E_b/N_0$  value may be degraded due to nonlinearity of the transmitter and synchronization errors at the demodulation. Figure 4

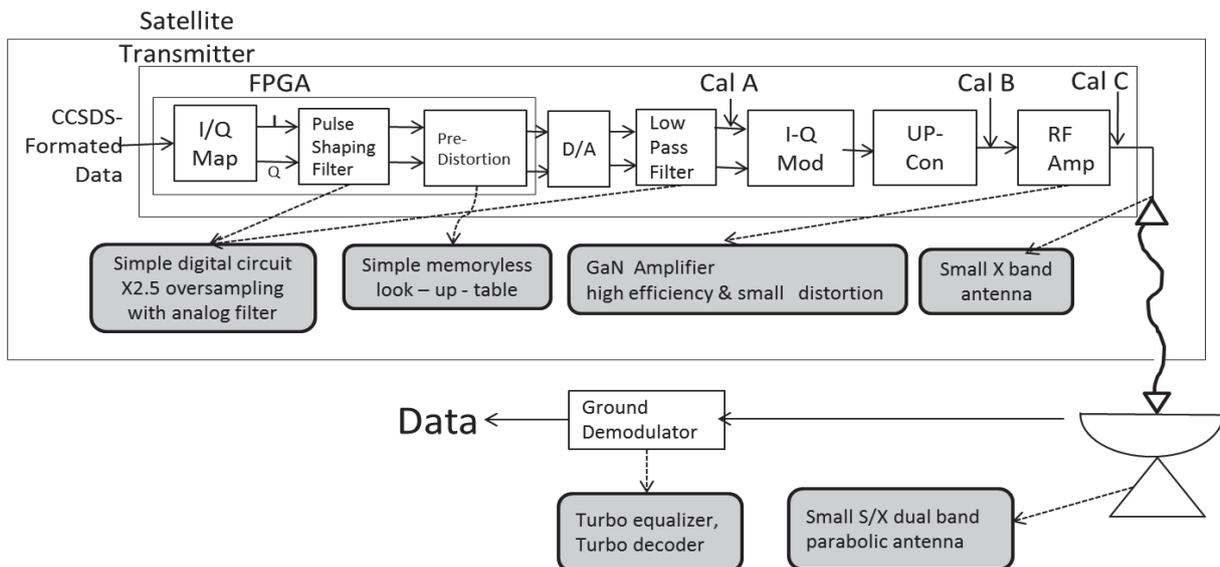


Fig. 3 System block diagram of high-data-rate on-board transmitter

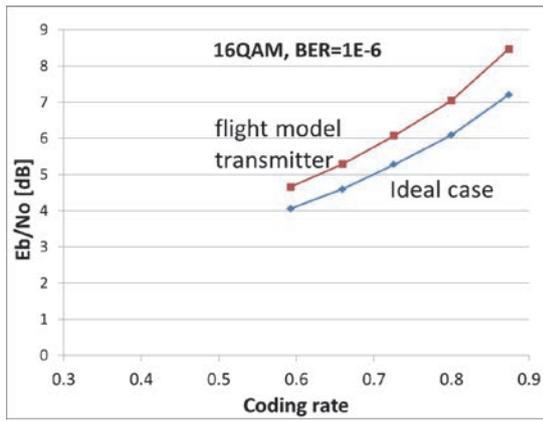


Fig. 4 Simulation results of required  $E_b/N_0$  with error correction as function of coding rate for ideal case as well as flight model of transmitter. 16QAM,  $BER=10^{-6}$

Table 2 Link Calculation

Items	Values	Comments
Satellite		
TX Power [dBW]	3.0	2W
TX Cable Loss [dB]	-1.0	
TX Ant Gain [dBi]	13.5	MGA
EIRP [dBW]	15.5	
Propagation		
Propagation Loss [dB]	-177.9	El=5° (2320km)
(altitude 600km)	-173.9	El=30°(1460km)
Rain & Atm. Loss [dB]	-2.1	incl. noise
Gnd Station		
RX Ant Gain [dBi]	47.5	3.8m diameter
Sys. Noise Temp [dBK]	20.0	100K
G/T [dB/K]	27.5	
Received C/No [dBHz]	91.6	El=5°
	95.6	El=30°

shows the required  $E_b/N_0$  for bit error rate  $10^{-6}$  with the ideal case as well as the flight model of the transmitter. In the latter case, we recorded the waveform of the transmitting signal from the flight model and added noises to the signal.

The onboard antenna for high speed down link at Hodoyoshi-4 satellite is a medium gain antenna with 13.5dBi gain and 2x2 patch array. Its beam width is about 20° and is directed toward a ground station with about 5° accuracy.

Link calculation was performed for Hodoyoshi-4 with 600km altitude. Table 2 summarizes the link calculation. The link margins can be calculated based on the received C/No, the required  $E_b/N_0$  and the data rate.

### 3. Onboard Instruments

#### 3.1 GaN-HEMT power amplifier

X band power amplifiers on satellites have widely used GaAs devices. Recently GaN HEMTs (high electron mobility transistors) achieve high efficiencies as high frequency and power devices. We have developed X band GaN-HEMT amplifiers in order to reduce power consumption.

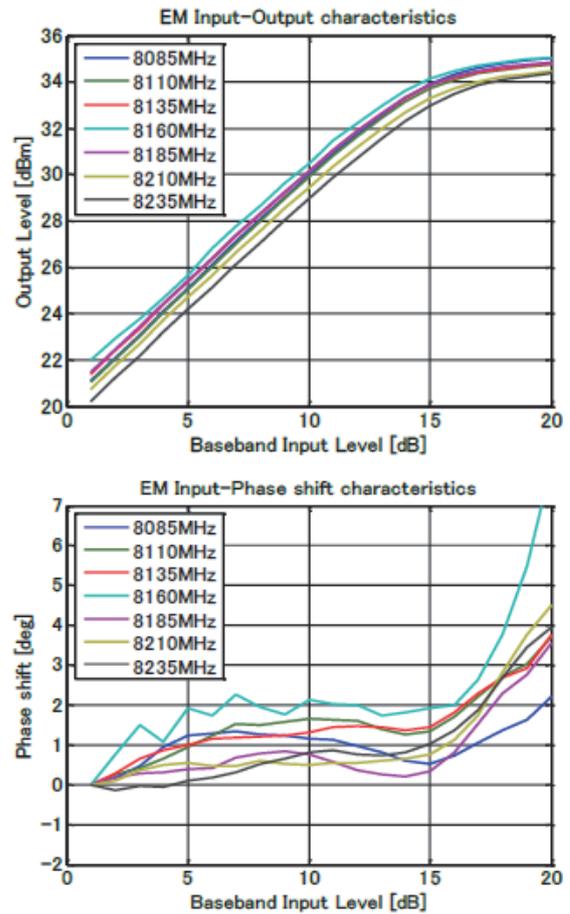


Fig. 5 Input-output characteristics of RF power amplifier in high speed transmitter. Upper: AM-AM characteristics, Down: AM-PM characteristics

Amplitude-phase modulation such as 16QAM requires linearity of RF amplifier. We have developed an AB class and a F class power amplifier with GaN-HEMT devices. It is found that an AB class is more suitable for our purpose than F class [4].

The AB class amplifier has saturated power of 35dBm at 8160MHz and output backoff is adjusted to 1-2dB. The power added efficiency reaches to 47%. Figure 5 shows input-output characteristics of AB class GaN-HEMT power amplifiers, AM-AM characteristics and AM-PM characteristics. Nonlinear phase change is less than 2° around the average output power level of 33-34dBm, which is operating point of the FM transmitter. This GaN-HEMT AB class amplifier is provided with both of high efficiency and small distortion characteristics.

#### 3.2 Flight model of transmitter

We have developed the 16QAM onboard transmitter with the AB class GaN-HEMT power amplifier. As the block diagram in Fig.3 indicates, in a FPGA input baseband signals are mapped in a 16QAM constellation and I, Q signals are pulse-shaping filtered. The clock frequency of the FPGAs reduces to 125MHz with

assists of 2.5 oversampling technique and parallel processing, even though the symbol rate is 100Msps.

It is found that the output power of the transmitter decreases by 1.2dB at 50°C, compared with one at 0°C. This fact means that output backoff or distortion characteristics change as the temperature changes. We provide the transmitter with an automatic level controller that keeps output backoff constant in order to keep almost constant quality of the communication link.

Figure 6 is a photograph of the onboard transmitter. The mass is 1.3kg and the power consumption is 22W, which is significantly small, compared with conventional products as indicated in Fig.2.

As an evaluation of the flight model of the transmitter, bit error rates (BER) were measured without error corrections. Figure 7 is the measured and the ideal bit error rate of 16 QAM. The measured bit error is degraded compared with the ideal one due to nonlinear effects of the amplifier on amplitude-phase modulation. Simulations shown in 2.2 indicate that SCCC of CCSS.131.2-B-1 and turbo equalizer and decoder can improve the bit error rate to less than  $10^{-6}$  in condition that uncoded bit error rate is less than

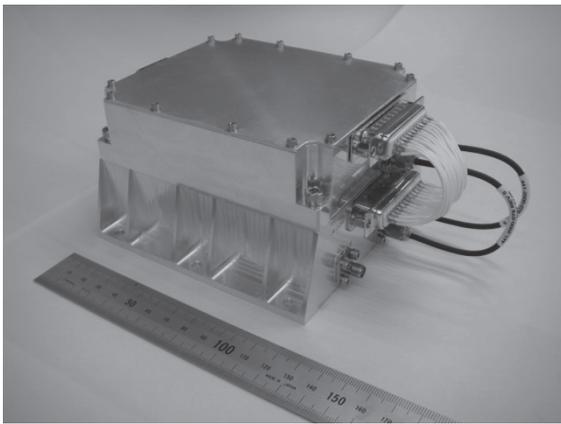


Fig. 6 Photograph of high-data-rate X-band 16QAM transmitter. Maximum data rate is 348 Mbps, RF output is 2W, DC power is 22W, and mass is 1330g and size is 120 x 120 x 73 mm<sup>3</sup>

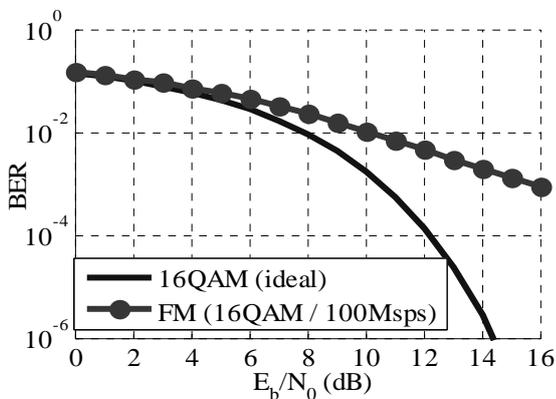


Fig. 7 Bit error rate without error correction. Solid line: ideal case. Circles : transmitter flight-model

$5 \times 10^{-2}$  at around  $E_b/N_0=10$ dB. Figure 6 indicates that the uncoded bit error rate is  $2 \times 10^{-2}$  at  $E_b/N_0=10$ dB, which satisfies this condition of  $BER < 10^{-6}$  with decoding and equalizing.

#### 4. Ground Station

Operation and data reception of small satellites require a compact, low-cost ground station. We have developed S/X dual band 3.8m antenna at Sagamihara campus of ISAS/JAXA (Fig.8) [7].

For demodulation and decoding processing there are hardware system with FPGAs or gateways [3] and software system. For the former system real time processing is possible. However, required hardware is very high performance and expensive especially for higher bit data rates than several 100Mbps.

On the other hand, the latter has merits of low cost of the hardware and flexibility of the software. The demerit is latency of processing. However, down link of earth observation data does not necessarily require real-time processing. Typically a visible time and an orbit period are 10 and 100 minutes, respectively. It is acceptable that the processing has finished by the next visible pass. In this high speed communication experiment, received signals are demodulated and decoded with software processing after a visible pass.

Intermediate frequency of 720MHz is digitalized at 400MS/s and is stored during a visible time. Then after the visible time the data is demodulated and decoded. Communication software SPW [5] is partially in use.

#### 5. Experiments with Hodoyoshi-4 Satellite

Hodoyoshi-4 satellite was launched at June 20<sup>th</sup>, 2014, 4:11 (JST) from Yasny, Russia by Dnepr rocket. Sagamihara 3.8m antenna station controls the satellite through S band as a main station from its first visible pass of June 20, 8:36. At the pass of June 22, 9:20, medium speed X band down link (10Mbps, QPSK, RS/Conv) from iso flux antenna (5dBi gain) was received at first time. Observed optical images were



Fig. 8 S/X dual band 3.8 m antenna at Sagamihara campus of ISAS/JAXA

successfully down-linked.

We have performed high speed down link experiments with for 16QAM, 100Msps for 237Mbps (ACM13) and 348Mbps (ACM17). The medium gain antenna (MGA, 13.5dBi, beam width of 20°) was utilized to satisfy its communication link. It is supposed that the satellite is attitude-controlled toward the earth station at coarse accuracy of 5° during high speed communications. However, the satellite was not ready yet for this attitude operation. Only coarse earth pointing mode is available. We performed high speed experiments when the satellite passed at higher elevation than 70° with earth-pointing attitude mode. In this condition, the earth station is inside a half beam width of the MGA.

We uploaded the down link test pattern data to the transmitter of Hodoyoshi 4. The test pattern was stored in the memory of the transmitter. The test pattern can be transmitted repeatedly to the ground. The down link test with 16 QAM of ACM 17, coding rate 0.87, 348 Mbps data rate was performed in December, 2014. The received data were digitalized and stored in the ground data recorder. After the visible pass a software process of blind demodulation and turbo-decoding were performed. Figure 9 shows the I/Q constellation at elevation of 84.5°, slant range of 622km. The four symbol points at the square corners are shifted inside due to the nonlinear AM-AM effect of the transmitter. However there is no AM-PM effect as indicted in Fig.4.

Measurement at the intermediate frequency 720MHz found the ratio between the received power and the noise spectral density is  $C/N_0=96\text{dBHz}$  and the ratio between the energy per a symbol and the noise spectral density is  $E_s/N_0=16\text{dB}$ . The measured bit error rate was  $1.2 \times 10^{-3}$  at 400Mbps uncoded signal and bit error rate after turbo decoding was less than  $1.7 \times 10^{-9}$ . There was no error bit in this test. This communication speed is the world-fastest one from 50kg class satellite at present.

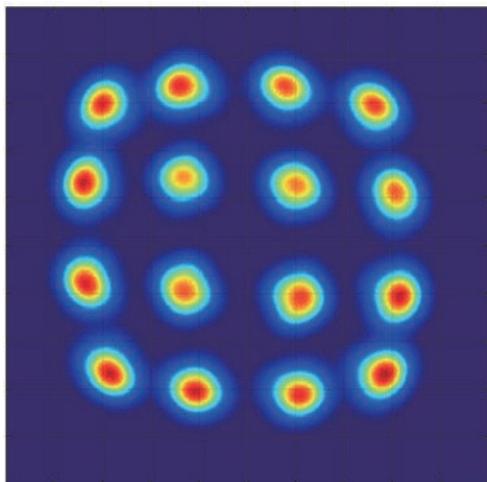


Fig. 9 Demodulated I Q constellation of 16QAM when satellite Hodoyoshi 4 achieved the world fastest down link speed as a 50kg class satellite

The simulation for bit error rates (Fig.4) shows that the required  $E_b/N_0$  is 8.5dB for BER after decoding  $<10^{-6}$  with the flight model of the transmitter. This means the required  $E_s/N_0=13.9\text{dB}$ . We have still 2dB margin in this experiment.

## 6. Conclusion

We have developed a compact 16QAM transmitter for small satellites with maximum 550Mbps, mass of 1.3kg and power consumption of 22W. This transmitter was onboard on Hodoyoshi 4 satellite with 66kg mass. The 348Mbps down link signal were received by 3.8m antenna and successfully demodulated. This communication speed is the world-fastest one from 50kg class satellite at present. Soon we will test the 64APSK modulation with 500Mbps bit rate.

This research will enhance very much the performance of earth observation with a 50kg class small satellite.

## 7. Acknowledgement

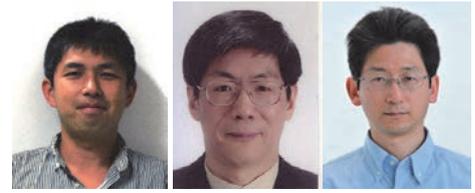
The authors thank Hodoyoshi project team for their supports. This research is partially supported by the Cabinet Office, Government of Japan and the Japan Society for the Promotion of Science (JSPS) through the Funding Program for World-Leading Innovative R&D on Science and Technology (FIRST Program).

## 8. References

- [1] S. Nakasuka, "From education to practical use of nano-satellites - Japanese university challenge towards low cost space utilization -," 8<sup>th</sup> IAA symposium on small satellite for earth observation, Berlin, April, 2011.
- [2] M. Toyoshima et al., "Log-likelihood coherent optical receiver – high-speed ADC less architecture -," IEICE Technical report vol.110, No.46, pp.19-23, 2010.
- [3] N. Iwakiri, A. Tomiki, T. Mizuno, H. Saito, and S. Nakasuka, "Performance analysis of SCCC turbo equalization with nonlinear satellite channel compensation techniques for nano/small satellite high-speed communication systems," Proc. ICSANE 2011, SANE-66, Bali, Indonesia, Oct. 2011.
- [4] Hirobumi Saito et al., "High-speed downlink communications with hundreds Mbps from 50kg class small satellites", 63<sup>rd</sup> International astronomical congress (IAC2012), Naples, Italy, Oct. 2012.
- [5] <http://www.synopsys.com/Systems/BlockDesign/DigitalSignalProcessing/Pages/Signal-Processing.aspx>.
- [6] Massimo Bertinelli, "CCSDS 131.2-R-1 SCCC simulation baseline," Feb, 11, 2011. Available at web.
- [7] H. Kayaba, H. Saito, T. Mizuno, A. Tomiki, "S/X band earth station antenna system for small satellites," 3 E06, The Japan society aeronautical and space sciences, The 58<sup>th</sup> Uchu kagaku gijyutu rengo kouenkai., Nagasaki, Japan, Nov. 2014.

# International PBL in Osaka Institute of Technology

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## 1. Introduction

In the recent years, many universities have employed active learning [1] as a method to increase students' creativity and learning outcome. One type of active learning where students use their own abilities to complete a given assignment, is known as project or problem based learning (PBL) [2]. PBL is especially important in the field of engineering where designing skills and creativity are crucial. Due to its importance, Osaka Institute of Technology (OIT) has implemented PBL to its core educational values.

Currently, OIT is working on International PBL (iPBL) where the students are able to explore their skills of “monotsukuri” (designing and manufacturing industry products) not only with their classmates but also with students from overseas. The program has successfully raised students' communication skills in English as well as skills in cultural exchange through a common goal, and thus has shown great effects on individuals' career plans.

This article will introduce an example of iPBL activities held amongst electrical, electronics and mechanical course students. Since mechanics and electrical-electronics areas in engineering are especially tied with industrial manufactures, we expect that the students could secure valuable experience for their future engineering career through iPBL with different countries and different areas of specialty.

## 2. Principle of the iPBL

This project has collaborated with National Taipei University of Technology (NTUT) in Taiwan since 2013, with the participants being 2<sup>nd</sup> and 3<sup>rd</sup> year electrical-electronics engineering students of OIT and mechanical engineering students of NTUT. Around 30 students joined the project, and were assigned into teams of 4 or 5 students from both universities to construct an intelligent vehicle in one week. During the duration, Japanese students accommodated in dormitories of NTUT, and stayed comfortably thanks to the kindness of Taiwanese students.

To take advantage of each student's area of specialty, the teams were encouraged to cooperate across fields by assigning specific tasks to each individual, such as automobile design and manufacture for mechanical students, sensor programming and motor circuit construction for electrical-electronics students as illustrated in Fig. 1.

At the end of the project, each team was instructed to run their vehicle in a circuit (with up /down hills, U shaped & S shaped curves, and gravel road), as exemplified in Fig. 2. The vehicle was to run precisely through the circuit without hitting the walls and to stop at the designated area in a specific time frame. To achieve these goals, the teams were equipped with major parts including differential gears and distance sensors. As for other necessary equipment and parts,

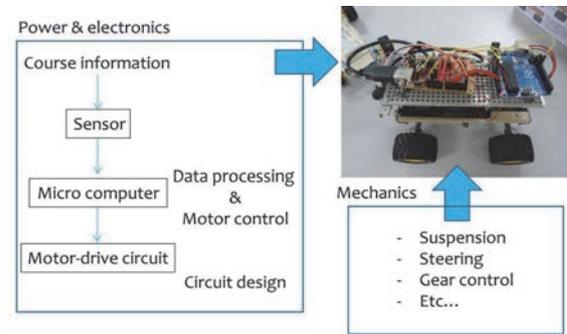


Fig. 1 Making an intelligent vehicle



Fig. 2 Circuit for the project

the teams were instructed to prepare individually within the given budget.

## 3. Implementation of the iPBL

Teams were urged to discuss the day's plan and each individual's task at the start of each day. Each team

was also asked to report on their daily progress at the end by briefly presenting their accomplishment for the day and answering questions. All these activities were conducted in English.

The following shows a brief summary of each day:

Day 1 focused mainly on traveling to the university, introducing each other, grouping the students, and providing a brief guidance.

The noon of the day 2 was spent explaining the logistics of the program, project goals, rules for building and running the vehicle, and the technologies used to construct the final product. During the afternoon, strategic plans were discussed and advised with each team.

On day 3, Prototypes were constructed, and critiqued and reviewed by teachers from both universities.

On day 4, test runs were conducted on the prototypes. Methods for improvements were planned and executed.

The final models were completed by the noon of day 5, and the final test run and competition were conducted during the afternoon.

On day 6, as a cultural exchange, NTUT students led OIT students around Taipei to experience Taiwanese culture. A commendation ceremony was held during the evening.

On day 7, the students and teachers said their good-byes, and traveled back to Japan.

By the end, all teams were able to complete the run with their respective vehicles. Figure 3 shows the examples of student-made vehicles. The winning team achieved almost full marks by meeting all requirements.

**4. Evaluation of the iPBL from Participating Students**

Through the iPBL, many of the students gained greater interest towards their area of specialty, leading to 60% of the participants planning to attend graduate school after college. This ratio is very high, since normally only 20% of electrical engineering graduates proceeds to graduate school in OIT. Furthermore, the participating students seem to reconfirm the importance of monotsukuri (designing and manufacturing industry products) as well as the significance of English language abilities through their experience. The results of a survey conducted on students of both universities after the the iPBL is summarized in Table 1.

Table 1 Survey Results for the iPBL 2014

This year’s iPBL was well planned	4.5 (3.9)*
The task was too difficult for this year	3.3 (3.2)*
I was glad to participate in the iPBL this year	4.8 (4.8)*
The schedule is appropriate	3.6 (3.4)*
The teaching staffs were very supportive during the duration	3.5 (3.6)*
Our team had successful discussions	4.5 (4.0)*
I gained values skills through iPBL that could be used in the future	4.4 (4.4)*

\*Out of 5 for each category. ( ) means 2013 results.



Fig. 3 Students-made vehicles



Fig. 4 Students in iPBL



Fig. 5 Students giving final presentation

**5. Conclusions**

This article introduces the International PBL activities in Osaka Institute of Technology. iPBL is effective to improve student’s motivation, technical knowledge and English communication skills. This project will be continued and 2015 project will be held in OIT at this summer.

**6. References**

[1] C. Bonwell, J. Eison “Active Learning: Creating Excitement in the Classroom AEHE-ERIC Higher Education Report No. 1,” 1991.  
 [2] Boud, D., & Feletti, G. “The challenge of problem-based learning (2<sup>nd</sup> ed.),” London: Kogan Page. p. 2, 1997.

# Report on the 7<sup>th</sup> IEICE Communications Society (CS) Welcome Party

Takashi Dateki, Fumio Futami, Eriko Takeda,  
Masakatsu Ogawa, Kejiro Take and Yoshihiro Ishikawa  
IEICE-CS Directors, Planning and Member Activities



## 1. About Welcome Party

Welcome Party is one of IEICE-CS major activities held at every IEICE General Conference. The objective of having this party is to provide young engineers especially students with a good opportunity to meet and talk friendly with experienced researchers and engineers in various organizations. It had been held at the IEICE Society Conferences in September from 2008 to 2011. However, considering school year in Japan (starting in April), in 2013, we moved it at General Conferences in March so that it can help students to think about their possible engineering carrier just before starting their new school year.

## 2. Welcome Party at 2015 General Conference

The 7<sup>th</sup> Welcome Party was held on 10<sup>th</sup> March 2015, the first day of IEICE General Conference at Biwako-Kusatsu Campus of Ritsumeikan University in Shiga, Japan. We had 201 participants including 83 students. It was a feature that many foreign students attended the party this year.

The first part of the party began with a welcome message from CS president, Dr. Kou Miyake (Fig. 1). Then it was followed by introductions of Technical Committee activities and research fields by Chair of Council of Technical Committee Representatives, Prof. Nobuyoshi Kikuma, (Fig. 2) and four Technical Committees of IEICE-CS: Communication Quality (CQ), Information and Communication Management (ICM), Smart Radio (SR) and Optical Communication Systems (OCS) (Fig. 3). Next, 17 companies and institutes put up poster exhibitions in the second part



Fig. 2 Introduction of IEICE-CS Technical Committees activities and research fields from Prof. Nobuyoshi Kikuma



Fig. 3 Presentations from Technical Committees



Fig. 1 Welcome Message from Dr. Kou Miyake

gave brief speeches for the students (Fig. 4).

After all speeches, the second part of the party started with a toast from CS Vice President, Atsushi Hiramatsu (Fig. 5), where foods and drinks were served. During the second part, all participants enjoyed food and drinks (Fig. 6) as well as free talk and discussion at the poster panels (Fig. 7). The poster panels were prepared by 17 companies that are active in IEICE-CS and also following 15 Technical Committees, Space, Aeronautical and Navigational Electronics (SANE), Electromagnetic Compatibility (EMCJ), Information and Communication Management (ICM), Information



Fig. 4 Speeches from industries for young researchers



Fig. 7 Talk and discussion at poster panels



Fig. 5 Toast from CS Vice President Atsushi Hiramatsu



Fig. 8 Concluding remarks from CS President-Elect (current CS President), Prof. Masahiro Umehira

(NV) and Extremely Advanced Optical Transmission Technologies (EXAT).

Finally, CS President-Elect (current CS President), Prof. Masahiro Umehira concluded the party (Fig. 8).

**3. Conclusion and Acknowledgement**

The 7<sup>th</sup> Welcome Party was successfully held with 201 participants at the IEICE General Conference 2015 at Ritsumeikan University in Shiga, Japan. Many participants both of young and experienced looked to have enjoyed this event and answered that they wanted to have more time to talk each other in the questionnaire that we collected at the end of the event. We would like to thank all participants, especially from companies and Technical Committee members that gave speeches and/or prepared poster panels to young researchers. We hope to have their cooperation again in the next Welcome Party which will be held in March 2016 at the IEICE General Conference at Kyushu University in Fukuoka, Japan.



Fig. 6 Enjoying food and drinks

Networks (IN), Smart Radio (SR), Ambient intelligence and Sensor Networks (ASN), Communication Systems (CS), Network Systems (NS), Optical Communication Systems (OCS), Optical Fiber Technology (OFT), Radio Communication Systems (RCS), Mobile Network and Applications (MoNA), Communication Behavior Engineering (CBE), Network Virtualization

## Report on 31<sup>st</sup> NS/IN Research Workshop

Yuichi Ohsita<sup>†</sup>, Daisuke Arai<sup>††</sup>, Yuichi Sudo<sup>†††</sup>, Takahiro Hamada<sup>†††</sup>,  
Katsunori Yamaoka<sup>††††</sup>, Hidetsugu Kobayashi<sup>††††</sup>, Shohei Kamamura<sup>††††</sup>,  
Masazumi Ota<sup>††††</sup>, Akira Shibata<sup>†††††</sup>, Takuji Tachibana<sup>†††††</sup>,  
Hideki Tode<sup>††††††</sup> and Atsushi Hiramatsu<sup>††††††</sup>

<sup>†</sup>Osaka Univ., <sup>††</sup>KDDI R&D Laboratories Inc., <sup>†††</sup>NTT Corp.,  
<sup>††††</sup>Tokyo Inst. of Tech., <sup>†††††</sup>NTT Software Corp., <sup>††††††</sup>Univ. of Fukui,  
<sup>†††††††</sup>Osaka Pref. Univ. and <sup>††††††††</sup>NTT-AT Corp.

### 1. Introduction

The 31<sup>st</sup> NS/IN Research Workshop took place in Okinawa, Japan, on March 2, 2015. The workshop was sponsored by the technical committee on Network Systems (NS) and Information Networks (IN) of the IEICE Communications Society. The workshop's aim was to discuss the technical direction and research topics for future networks. A record showing of 169 participants testified to the success of the workshop. The overall theme was "Trends and Changes for Cyber Security –Is Cyber Security in Japan Sufficient?–." The workshop featured one invited talk session and one panel session.

### 2. Invited Speakers

The general chair of the workshop, Mr. Atsushi Hiramatsu (NTT Advanced Technology Corp.), invited 5 distinguished experts in cyber security (Figure 1). These speakers addressed current trends and new challenges for the cyber security. Figures 2 to 6 show photographs of the speakers.

- Mr. Koichi Arimura (Japan Computer Emergency Response Team (JPCERT) Coordination Center) presented the trends in the cyber security in Japan, including the trends of the security incidents, analysis of the threats, and the law related to the cyber security.



Fig. 1 Opening speech of the workshop  
Mr. Hiramatsu (top) and Dr. Miyake (bottom)



Fig. 2 Invited speakers: Mr. Arimura

- Mr. Hisao Iizuka (Gurunavi, Inc. and Telecom-ISAC Japan) presented the challenges of the cyber security from the viewpoints of telecommunication carriers.



Fig. 3 Invited speakers: Mr. Iizuka

- Mr. Takeshi Ito (Information-technology Promotion Agency, Japan (IPA)) presented the activity of IPA against targeted cyber-attacks.



Fig. 4 Invited speakers: Mr. Ito

- Dr. Daisuke Inoue (National Institute of Information and Communications Technology (NICT)) presented the trends and challenges in the research on the cyber security.



Fig. 5 Invited speakers: Dr. Inoue

- Mr. Masakazu Takahashi (Microsoft Japan Co., Ltd.) presented the trends of the bot nets and the technologies against bot nets.



Fig. 6 Invited speakers: Mr. Takahashi

### 3. Panel Session

After the invited talks, the panel session was held. The session was moderated by Dr. Kou Miyake (NTT DATA INTELLILINK Corp.). All of the above invited speakers were invited as panelists. In this session, the challenges of the cyber security were discussed.



Fig. 7 Audience-filled hall

### 4. Conclusion

This year's workshop invited key persons to speak on the cyber security in Japan. The audience filled the hall. We believe that the presentations given by the invited speakers and the discussion provided fruitful insight into research and development.

The technical committee on IN and NS plans to hold next year's workshop in March 2016. Finally, we would like to express our gratitude to the workshop committee members, particularly to Shohei Inaba (Oki Electric Industry Co., Ltd.), Tadashi Komatsu (NEC Corp.), Masashi Ito (TOSHIBA Corp.), Takeshi Kodama (FUJITSU LABORATORIES Ltd.) and Daisuke Mashimo (Hitachi, Ltd.) who made this workshop possible.

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

Yuichi Ohsita<sup>†</sup>, Daisuke Arai<sup>††</sup>, Yuichi Sudo<sup>†††</sup>, Takahiro Hamada<sup>†††</sup>  
<sup>†</sup>Osaka Univ., <sup>††</sup>KDDI R&D Laboratories Inc., <sup>†††</sup>NTT Corporation

### 1. Introduction

The technical committee on Information Networks (IN) is one of technical committees of the Communications Society of the IEICE [1]. The IN addresses a broad spectrum of issues associated with information networks and provides a forum for researchers and engineers to discuss various research and development topics. The chairman is Mr. Hidetsugu Kobayashi of NTT Corporation. The vice chairman is Assoc. Prof. Katsunori Yamaoka of Tokyo Institute of Technology. The secretaries are Mr. Daisuke Arai of KDDI R&D Laboratories Inc. and Mr. Takahiro Hamada of NTT Corporation. The assistant secretaries are Assist. Prof. Yuichi Ohsita of Osaka Univ. and Dr. Yuichi Sudo of NTT Corporation. This document presents the IN's annual report for activities from April 2014 to March 2015.

### 2. IN Activities

The IN is one of the most active technical committees of the IEICE Communications Society. The IN held two-day technical meetings 10 times from April 2014 to March 2015. Some meetings are co-organized with other institutes such as IEE or other technical committees in IEICE such as RCS, ICT-SG, NV, NS, CS, MoNA and IA. Many researchers participated in the meetings and reported their latest technical research and development results. The venues and the main topics of each meeting are shown in Table 1.

Each technical report is submitted in a paper and published as a Technical Report of the IEICE. Authors of selected papers have received Information Networks Research Awards in which the ceremony is held in March every year.



Fig. 1 Winners of IN Research Award in 2014  
 (From left to right) H. Kobayashi (Chairman),  
 M. Suzuki, H. Obata, R. Hamamoto, C. Takano,  
 T. Inoue and K. Yamaoka (Vice Chairman)

This year, the following 3 excellent papers were selected from 166 papers.

- Ryo Hamamoto, Hiroyasu Obata, Chisa Takano, Kenji Ishida, Koutaro Yamada, “Media Access Control Mechanism Based on Synchronization of Coupled Oscillators over Wireless LAN.”
- Takeru Inoue, Toru Mano, Kimihiro Mizutani, Shin-ichi Minato, Osamu Akashi “Packet Classification for Global Network View of SDN with MDDs”
- Masaki Suzuki, Masafumi Watari, Shigehiro Ano, Masato Tsuru, “Traffic Classification on Mobile Network Considering Various Types of Network Traffic Flow”

### Reference

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

Table 1 Technical meeting schedule

Date,	Venue,	Main topics,	Num. of reports,	Num. of participants each day,
Apr. 17-18	Kyotofu-Chusho-Kigyo-Kaikan (Kyoto)	Home Area Network (HAN), Green/Energy Saving ICT, Smart Grid, Contingency Plan/BCP, Data Analysis/Processing Platform, Big Data, etc.	7	65, 55
May. 15-16	Kikai-Shinko-Kaikan Bldg. (Tokyo)	Wireless Internet, Multi-hop network, Mesh network, Network coding, Cross layer technique, Wireless communication, etc.	8	58, 48
Jun. 26-27	Kagawa Univ. (Takamatsu)	Web Service/SOA/ROA Platform, Social Networking Service (SNS), Authentication/ID management, Network Coding/Network Algorithms, Data Analysis/Processing Platform, etc.	14	27, 18
Jul. 17-18	Hokkaido Univ. (Sapporo)	Cloud Networking, SDN, OpenFlow, Virtual Private Network (VPN), Overlay Network/P2P, Network configuration, etc.	20	51, 37
Sep. 11-12	Tohoku Univ. (Sendai)	Post IP networking, Next Generation Network (NGN)/New Generation Network (NWGN), Contingency Plan/BCP, Network Coding/Network Algorithms, Session Management (SIP/IMS), Internetworking/Standardization, Network configuration, etc.	24	82, 78
Oct. 16-17	Osaka Univ. (Osaka)	Contingency Plan/BCP, Robustness, Security and Privacy, Authentication/ID management, Web Service/SOA/ROA Platform, Social Networking Service (SNS), etc.	7	15, 16
Nov. 18-19	Simonosekishi-Kinro-Fukushi-Kaikan (Shimonoseki)	Ubiquitous Network, BYOD, M2M, Contextware, Mobile Social Service, Mobile Service on Virtualization Environment, Mobile Offload, etc	10	33, 36
Dec. 18-19	Hiroshima City Univ. (Hiroshima)	Performance Analysis and Simulation, Robustness, Traffic and Throughput Measurement, Quality of Service (QoS) Control, Congestion Control, Overlay Network/P2P, IPv6, Multicast, Routing, DDoS, etc.	7	36, 37
Jan. 22-23	Nagoya International Center (Nagoya)	Contents Delivery/Contents Exchange, Social Networking Service (SNS), Data Analysis/Processing Platform, Big Data, etc.	23	28, 31
Mar. 2-3	Okinawa Convention Center (Ginowan)	General topics and workshop	55	178, 223

# Activities of Technical Committee on Optical Fiber Technologies (OFT)

Hidehito Hirota\* Masaki Ohmura\*\*  
NTT\*, Sumitomo Electric Industries Ltd.\*\*



## 1. Introduction

The OFT is one of the technical committees of Communications Society of the IEICE. One of the most important aims of our committee is to contribute to technological innovation of optical fiber technologies for development of industrial applications by focusing on the technologies from cross-sector viewpoints on the communication engineering, measurement technologies, optical devices, and materials.

## 2. Covered Research Fields

OFT concerns itself with a wide variety of research related to optical fibers and optical systems (Table 1).

Table 1 Topics

Major Topic Areas	Topics
Optical fiber sensing	Optical fiber probe, Optical fiber gyroscope, Optical fiber sensor device, Distributed optical sensing, Remote optical sensing, Optical fiber measurement, Optical reflectometry
Optical fiber devices	Optical signal information processing, Optical fiber interferometer, Optical fiber amplifier, Optical fiber laser, Optical fiber coupler/splitter, Optical filter
Optical fiber systems	Image/Illumination/Display, Material processing system, Medical system, Biological system, High-power system, Environmental system, Communication system
Optical fiber wiring/ installing, maintenances/ operations	Testing system for optical line, Management for optical line, Reliability of optical line, Design of optical line, Construction technique for optical line, Optical connector/interconnection, Optical line components
Design of optical fiber/ cable	Characterization of optical fiber, Reliability of optical fiber, Optical propagation analysis, Analysis of optical fiber character, Optical fiber cable/Optical fiber cord, Optical fiber for various use

## 3. OFT Activities

The OFT holds one- or two-day technical meetings six times a year. At the meetings, many researchers participate and report the latest results of their research. The schedule from May 2015 to March 2016, consisting

of six regular technical meetings is shown in Fig. 1. Several of them are co-organized with the OCS (Optical Communication Systems), LSJ (Laser society of Japan), IEE-CMN (Institute of Electrical Engineers of Japan - Communications), ITE-BCT (Institute of Image Information and Television Engineers – Broadcast Technologies), and OPE (Opto-electronics) committees. The number of the presented papers at regular meetings in the last year was 70 and the number of participants was 536.

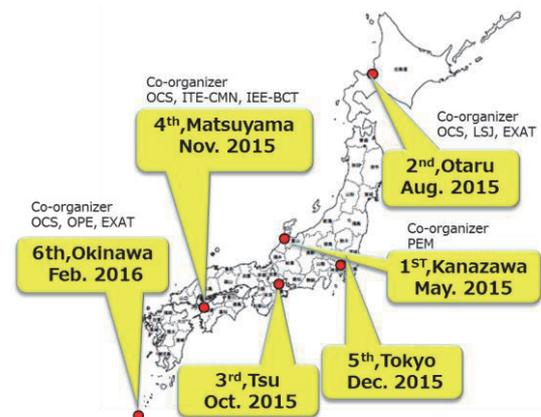


Fig. 1 Regular technical meetings

## 4. Public Relations Activities

Are you on Facebook? We send information of OFT activities through our Facebook.

<https://www.facebook.com/ieiceoft>

## 5. OFT Encouragement Award

OFT encourages research activities of younger researchers. Since the program was launched in 2011, it has commended 12 award winners up until the 3<sup>rd</sup> award for outstanding younger researcher in 2014. Encouragement award in 2014 was as follows:

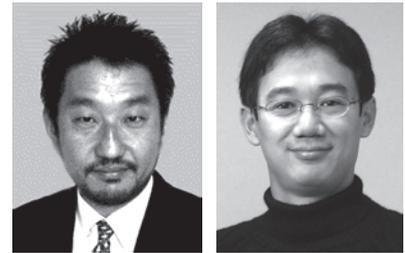
- 1) “Multi-core Fiber Fan-out Device Using Coupling Lens” by Hajime Arao, Sumitomo Electric Industries, Ltd.
- 2) “Design of low DMD few-mode fibers supporting large number of modes for mode-division-multiplexed transmission” by Takayoshi Mori, NTT
- 3) “True Time Delay Beamforming Using Semiconductor Optical Amplifier and Tunable Dispersion Medium for Phased Array Antenna” by Minamoto Yamato, The University of Electro-Communications.
- 4) “A Study of Fused Type Fan-in /Fan-out Devices for Two-Mode Multi-Core Fibers” by Kouhei Masumoto, Hokkaido University.

# Position Paper, a New Category in IEICE Transactions on Communications

Hisato Iwai<sup>†</sup> and Hiraku Okada<sup>‡</sup>

<sup>†</sup>Editor-in-Chief, IEICE Transactions on Communications

<sup>‡</sup>Editor, IEICE Transactions on Communications



## 1. Introduction

Expansion of the field of communications has unlimited boundaries, and research and development (R&D) has been continuously pursued to support this expansion. A lot of new key ideas are emerging and open up novel research areas, which become driving force of further development of communications technologies. Aiming at the world's best performance has been also one of the major driving forces of R&D, and its resulting outputs lead to the stimulation of the R&D itself in turn. The IEICE Transactions on Communications planned the Special Sections for position papers [1], [2], which exhibit novel ideas and/or significant achievements leading to such innovative technologies. A considerable number of papers were submitted to the Special Sections, which convinced us the potential demand for the category of position papers. Thus, the IEICE Transactions on Communications has decided to start the new category, **POSITION PAPER**, on October 1, 2015.

## 2. Features

POSITION PAPER is defined as an article with at least one of the following features, potentially having a significant influence to the theory and practice of communication technology:

- Introduction of novel viewpoints, frameworks, and/or paradigms
- Proposal of technologies or methods based on innovative ideas (not just extension of existing technologies)
- Novel ideas with the potential to bring about innovative technologies
- Prototyping or experimental results with noteworthy features, such as achievement of the world's best performance or the world's first realization

Only papers having the significant feature(s) above will be accepted, while comprehensive evaluations of the performance or the effectiveness will not be required.

POSITION PAPER is available by open access through the website of the IEICE Transactions on Communications. POSITION PAPER submitted by September 30, 2017 will be exempted from the page charges up to the fee required for 50 reprints of four pages with electronic source data using the IEICE LaTeX style file.

## 3. Scope

Whole research areas covered by the IEICE Transactions on Communications, such as:

- Fundamental Theories for Communications
- Energy in Electronics Communications
- Transmission Systems and Transmission Equipment for Communications
- Optical Fiber for Communications
- Fiber-Optic Transmission for Communications
- Network System
- Network
- Internet
- Network Management/Operation
- Antennas and Propagation
- Electromagnetic Compatibility (EMC)
- Wireless Communication Technologies
- Terrestrial Wireless Communication/Broadcasting Technologies
- Satellite Communications
- Sensing
- Navigation, Guidance and Control Systems
- Space Utilization Systems for Communications
- Multimedia Systems for Communications

## 4. Further information

Please visit the journal web site at: <http://www.ieice.or.jp/cs/jpn/EB/>

## 5. References

- [1] H. Iwai, "Special section on position papers exploring innovative intelligence and technologies in communications," IEICE Trans. Commun., vol.E98-B, no.1, Jan. 2015, and no.3, Mar. 2015.
- [2] S. Kasahara, "Special section on position papers exploring innovative intelligence and technologies in communications, part II," IEICE Trans. Commun., vol.E98-B, no.12, Dec. 2015 (under review).

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

Kazuma YUMOTO (Hitachi), ICM Secretary  
 Yuji NOMURA (Fujitsu Lab.), ICM Secretary  
 Eiji TAKAHASHI (NEC), ICM Assistant



## 1. Introduction

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

## 2. Activities

The ICM held two-day technical meetings 5 times from May 2014 to March 2015. The venues and the main topics of each meeting are shown in Table 1. In addition, 3 special sessions were sponsored by ICM as shown in Table 2.

Of particular note, in the English session in 2014 IEICE Society Conference at Tokushima University, the number of papers reached 36 in total. This session was hosted and presented entirely in English. The purpose of this session is to promote the globalization of IEICE by providing the participants staying in Japan or joining from overseas with more opportunities for presentations and discussions in English.

Table 1 ICM Technical Meetings in 2014

No	Date	Venue	Main Topics	Joint
1	May. 22-23	HorutoHall OITA (Oita)	Service Management, Operation/Administration, Security Management, etc.	IPSIJ-IOT IPSIJ-CSEC
2	July 10-11	Aiina Center (Iwate)	Management Function, Management Theory, etc.	-
3	Nov. 13-14	Cul-Port (Kochi)	Network Quality, Network Management and Measurement, Network Virtualization	CQ, NS, NV
4	Jan. 15-16	Kanmon Straits and Mojiko Retro (Fukuoka)	Applications and Research Opportunities of Life Log, Office Information System and Business Management	LOIS
5	Mar. 19-20	Ishigaki Civic Hall (Okinawa)	Element Management, Management Functionalities, Operations and Management Technologies, etc.	-

Table 2 Special Sessions by ICM in 2014

Title	Date	Remarks	Theme
English Session	Sep. 23-26	As one of Symposium Sessions in IEICE Society Conference	Network and Service Design, Control and Management
APNOMS	Sep. 25-27	The premier conference in the Asia Pacific region sponsored by ICM	-
ICM Workshop	Mar. 19	Held in conjunction with ICM Technical Committee Meeting 6th	Service and Management Technology on M2M/D2D/IoT



Fig. 1 The panel session at Ishigakijima

Furthermore, ICM Workshop 2015 was held in Ishigakijima (Okinawa pref.). In the panel session, five invited speakers presented and discussed the theme, to the obvious interest of the more than 50 attendees. A banquet was held to promote social intercourse, and at the same time, to celebrate the ICM annual award winners in 2014.

## 3. Awards and Upcoming Event

The winners are shown in Table 3. The English Session Encouragement Award is given to the author of the best papers of the English session, every year. ICM committee is now calling for submission for the upcoming English session; the deadline is 1<sup>st</sup> July [1].

Table 3 Winners of ICM Awards in 2014

Award	Winners	Title
Research Award	Shinichiro Suda	Usefulness on Resource Management Model Considering a Sway in the Network Service Systems
	Satoshi Yazawa, et al.	Practical application of Cloud Monitoring using a huge Map
English Session Encouragement Award	Ms. Zilu Liang	Microscopic Route Guidance System with Vehicle-Level Rerouting for Facilitating Smooth Travel in City Areas
	Mr. Kevin Pognart	A STUDY ON KEYWORD-BASED SEARCH METHODS FOR BREADCRUMBS-BASED CONTENT-ORIENTED NETWORK
	Dr. Tananun Orawiwattanakul	Multiple Classes of Service Provisioning in DCN

## 4. Reference

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

# Report on NS English Session at 2015 IEICE General Conference – BS-3 Advanced Technologies in the Design, Management and Control for Future Innovative Communication Network –



Kazuya Tsukamoto<sup>\*</sup>, Takuji Tachibana<sup>\*\*</sup>, Shohei Kamamura<sup>\*\*\*</sup>, Masazumi Ota<sup>\*\*\*</sup>,  
Akira Shibata<sup>\*\*\*\*</sup>, Hideki Tode<sup>†</sup>, and Atsushi Hiramatsu<sup>††</sup>  
<sup>\*</sup>Kyushu Inst. of Tech., <sup>\*\*</sup>Univ. of Fukui, <sup>\*\*\*</sup>NTT Corp., <sup>\*\*\*\*</sup>NTT Software Corp.,  
<sup>†</sup>Osaka Pref. Univ., <sup>††</sup>NTT-AT Corp.

## 1. Introduction

The 2015 IEICE General Conference was held at Ritsumeikan University in Shiga, Japan, on March 10-13, 2015. In the conference, the IEICE Technical Committee on Network Systems (NS) [1] provided the complete English Symposium Session entitled “Advanced Technologies in the Design, Management and Control for Future Innovative Communication Network” as one of the eight Symposium Sessions hosted by IEICE Communications Society.

## 2. Background

NS has managed such an English Session since 2005, in order to promote the globalization of IEICE. The Session has provided the attendees staying in Japan or joining from overseas with more opportunities of presentations and discussions in English.

This year, 60 papers were submitted to the Session, which enabled organize sessions during whole of 4-days conference period. Table 1 shows the historical

Table 1 History of NS English Session

Year	Theme	#
2005	Network Controls for High-Quality Communications	11
2006	Technologies and Architectures for Ubiquitous Network Systems	19
2007	Traffic Measurement, Analysis and Network Controls for Comfortable Network	12
2008	Network Management Technologies for Next Generation Network	20
2009	System, Control and Design Technologies for Emerging Network	34
2010	Emerging Network Technologies for Ambient Information Society	34
2011	Network Design, Management and Control for Future Networked Systems	43
2012	Management and Control Technologies for Innovative Networks	43
2013	Network Control and Management Technologies for Next Generation Applications	62
2014	Future Network Technologies for Advanced Information and Communications Society	76
2015	Advanced Technologies in the Design, Management and Control for Future Innovative Communication Network	60



Fig. 1 Presentation in English Session BS-3

theme and the number of presented papers.

## 3. Topics and Statistics

The papers were classified into 15 sub-sessions based on the topics. The sub-sessions were held every day during the General Conference. In each session, a wide range of topics including future network technologies such as wireless/mobile networking, network virtualization represented by SDN/NFV, content oriented networks (ICN/CCN/NDN), photonic networks, green ICT, and others was actively discussed between attendees every day, as shown in Fig. 1.

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

## 4. Conclusion

NS English Session was very successful due to many excellent papers and active discussions. The organizer believes that this activity is fruitful for all participants and effective for the globalization of IEICE. In addition, NS will select the best papers and award a prize of the session in the near future to encourage their continuous activities.

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

## 5. Reference

- [1] IEICE Technical Committee on Network Systems web site, <http://www.ieice.org/~ns/eng/>.

# Report on the 8<sup>th</sup> International Workshop on Cooperative and Heterogeneous Networks (WDN-CN2015)

Ehab Mahmoud Mohamed<sup>†</sup> Gia Khanh Tran<sup>††</sup>  
<sup>†</sup>Osaka University <sup>††</sup>Tokyo Institute of Technology



## 1. Introduction

Following the successful events of the International Wireless Distributed Network (WDN) workshop on Cooperative and Heterogeneous Networks previously held in Cannes France in 2008, Tokyo Japan in 2009, Istanbul Turkey in 2010, Toronto Canada in 2011, Sydney Australia in 2012, London England in 2013, and Washington USA in 2014 [1] respectively, The 8<sup>th</sup> WDN-CN2015 was held in conjunction with IEEE Wireless Communications and Networking Conference (WCNC 2015) on 9<sup>th</sup> March 2015 in New Orleans, USA [2]. The 8<sup>th</sup> WDN-CN2015 was technically co-sponsored by IEICE Communications Society. WDN-CN2015 is a full-day workshop at WCNC2015 which attracts many audiences of the conference.

## 2. Workshop Committee

Ms. Jessica Oueis from CEA-LETI (France)  
Prof. Kei Sakaguchi from Osaka University (Japan)  
Dr. Emilio Calvanese Strinati from CEA-LETI (France)  
Dr. Thomas Haustein, Fraunhofer HHI, (Germany)

## 3. Scope and Objectives

The enormous increase in the mobile connected equipment and mobile subscribers number, in addition to the emergence of data-centric standards such as 3GPP's LTE-A raises an urgent call to find sustainable solution that permits to fulfil data rate, spectrum, and coverage requirements. Data rate has been increasing exponentially over the last decade since mobile users want to access to the internet and mobile services anytime anywhere. However, the resources are scarce and the frequency spectrum availability is limited. More challenges are imposed like the energy consumption of the network. Adding cellular macro base stations to the existing cellular network is energy consuming and very expensive. Macro base stations are very high power nodes with high energy consumption. Deploying such base stations increases dramatically the CAPEX due to the installation costs, as well as the OPEX for the base stations maintenance and operations. This solution also suffers from the inevitable out-of-cell interference issues. Making matters worse, conventional macro cell transmissions suffer from poor indoor penetration and the presence of dead-spots particularly at higher carrier frequencies, which results in drastically reduced indoor coverage and diminished user satisfaction.

Mobile networks need a low cost, low power, energy efficient, and easy to deploy solutions, which satisfy the ever-growing capacity demand. A promising approach to solve this problem is through the deployment of Heterogeneous and Small Cell Networks (HetNets), which represents a novel networking paradigm based on the idea of deploying low-power, and low-cost base stations operating in conjunction with the macro-cellular network infrastructure. HetNets are envisioned to enable next-generation networks to provide high data rates, offload traffic from the macro cell, minimize energy consumption and provide dedicated capacity to homes, enterprises, or urban hotspots. HetNets encompass a broad variety of cell types, such as macro-, pico-, femto-cells, as well as advanced wireless relays, and distributed antenna systems.

There are significant technical problems that need to be addressed for the successful deployment and operation of HetNets. In particular, due to lack of coordination with the rest of the network, time- and frequency domain interference management in dense HetNets is a fundamental issue. By exploiting ideas from traditional multi-cell power control, cognitive radio and dynamic spectrum access, HetNets should be designed to deal with peak data demands, and react based on interference/load/congestion levels, by adapting their transmission strategy and opportunistically accessing radio resources over licensed and unlicensed bands. Recently, in addition to the integration of cellular and WiFi that has emerged as a key component to tackle the capacity crunch problem and ease network congestion, new solutions have been proposed to increase network efficiency. C-RAN is a novel network architecture which is centralized, cooperative, and embraces cloud computing. This architecture can allow baseband sharing, reducing energy consumption, and improving network performance. Furthermore, recent advances in the understanding of interference channels, cooperative games and distributed optimization theory could be useful for novel designs of the next generation of HetNets. Small cell networks could benefit from CoMP transmission schemes wherein multiple base stations steer their beams through array processing to minimize interference. Interference coordination is also another solution to minimize interference and to improve the network performance. Coordination between small cells is not restricted to resources management.

Recently, base stations clustering and coordination have been studied as a mean for improving the network energy efficiency, users' QoE, and for delivering cloud services via cooperation and via pooling computational and communication resources. Base station should also cooperate for delivering cloud services. HetNet could also benefit from cloud cooperation and virtual operation implementation in order to operate efficiently. In addition, with the existence of several networks and the usage of different radio access technologies imposes overarching requirements for a multi-RAT architecture evolution. Finally, research on small cell networks also tackles several issues that contribute in making HetNet operate more efficiently via cloud cooperation such as mobility management, service centric scheduling, and C/U splitting.

Following the past events, WDN-CN2015 gathered participants from both academia and industry to offer a forum for spreading and sharing the latest results and understanding for making communication networks more spectral and energy efficient than they are today.

#### 4. Summary of WDN-CN2015

WDN-CN2015 was held at Capital Hilton, which is a hotel located in the heart of the New Orleans city and serves as a convenient base for sightseeing in the historically rich city. The workshop was divided into four sessions including 8 accepted papers and 2 keynote speeches. In the opening, Dr. Emilio Calvanese Strinati, one of the general co-chairs of the workshop, briefly explained the scope of WDN-CN2015, introduced the program.

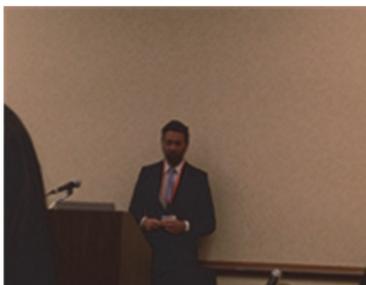


Fig. 1 Keynote 1 (Dr. K. Dimou)

In the first invited talk, Dr. Konstantinos Dimou from Intel Corporation (USA), who is currently a senior research scientist in integrated computing research in Intel Labs, talked about “Multi-Radio Heterogeneous Networks Within 5G Communication Systems”. The speaker first introduced the concept of Multi-Radio Access Technology (RAT) and the evolution of multi-RAT HetNets in 3GPP LTE Release 8 to 12. Also, he talked about the Access Network Discovery and Selection Function (ANDSF) in the current loosely coupled HetNets proposed by 3GPP. For Release 12 and beyond, a novel tightly coupled RAT combining LTE and WLAN would work on even unlicensed bands to increase system capacity and fully control the HetNet operation using recent advanced technologies such as C/U plane splitting. In the latter part, the speaker presented Intel's vision on 5G, which must have a 1000x higher system capacity, 100x more

connected devices, 10x QoE and longer battery life. The speaker pointed out that rather than air interface, network evolution e.g. cell densification, WLAN offloading, integrated multi-RAT is more important to realize 5G. The speaker also showed his vision on 5G devices which should support multi-antenna system, multi-band RF front-end, multi-band transceiver and integrated baseband signal processing. Recent simulation analysis for tightly coupled HetNets done by Intel research group is also given by the speaker.



Fig. 2 Keynote 2 (Dr. Soumaya)

In the second invited talk, Dr. Soumaya Hamouda, from Carthage University, Tunisia, talked about the feasibility of win-win relationship in HetNets. In her talk Dr. Soumaya formulated the bandwidth sharing between the macro cell and small cells as a win-win relationship, in which both macro cell and small cells make benefit from each other. Game theory is extensively used in her derivations. Her approach is formulated as a Stackelberg game, in which the macro cell is selling bandwidths to femto cells in exchange of some victim macro-users to serve, mainly the macro-users who undergo severe interference from the neighboring femto cells. She demonstrated that her game theoretic reaches a stable state called Stackelberg equilibrium analytically and by simulations. More importantly, she showed that overall network performance is improved in terms of total femtocells' throughputs and spectral efficiency of the macro-users who are in the vicinity of the femtocells. Then, she explained her team vision regarding the relationship between the macrocells and femtocells, in which they will change the game formulation to take the positive side of the interference.

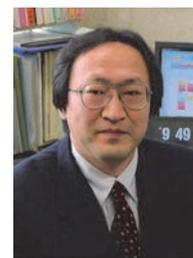
In addition to the two keynote speeches, there were two technical sessions included 8 accepted papers for presentations. The presenters talked about several issues and their last research achievements in the area of HetNets and 5G networks, including delayed offloading using cloud cooperated HetNets, efficient network selection in HetNet using position information, comparison between CoMP and MISO in HetNets, user association, power control and beamforming in HetNet, Inter-cell coordination in HetNets, load balance in HetNets, distributed user association in energy harvesting HetNets, and MAC design for unlicensed LTE.

[1] <https://sites.google.com/a/icwdn.org/wdn2015/>

[2] <https://sites.google.com/a/icwdn.org/wdn2015/past>

# Report on 2014 International Symposium on Antennas and Propagation (ISAP2014)

Hiroyoshi Yamada  
Niigata University, ISAP JSC Secretariat



## 1. ISAP2014

2014 International Symposium on Antennas and Propagation (ISAP2014) was held at Grand Hai-Lai Hotel, Kaohsiung, Taiwan from December 2<sup>nd</sup> to 5<sup>th</sup>. This was the eighth ISAP outside Japan since the symposium started to be held in Asia-Pacific region every year. It was the second ISAP in Taiwan. The last ISAP in Taiwan was held in Taipei in 2008. The organizer was National Sun Yat-sen University, and the Institute of Antenna Engineers of Taiwan was the co-organizer. This symposium was technically cosponsored by 4 academic organizations including the IEICE Communications Society. In addition, it was also co-sponsored by 13 research institutes and companies.

As General Chairs, Prof. Kin-Lu Wong (National Sun Yat-sen Univ.), and as Technical Program Committee (TPC) Co-chairs, Prof. Wen-Shan Chen (National Sun Yat-sen Univ.) and Prof. Tzyh-Ghuang Ma (National Sun Yat-sen Univ.) served.

The size of the symposium reached the top level of former ISAP symposia as shown in Table 1. Papers were submitted from 28 countries/regions not only in Asia-Pacific but all over the world. Table 2 shows the ranking countries/regions with accepted papers number of five or more. Approximately 130 reviewers including TPC members nominated by international review system contributed energetically multiple-review work in a limited time and supported TPC.

The first day, December 2<sup>nd</sup>, three invited lecturers' workshops were held. In addition, we held a get-together at "Meet with IEEE TAP Editor-in-Chief", which was a new trial in ISAP. It will activate young researchers' motivation for submission.

After these workshops, opening ceremony, and two plenary speeches, 37 technical oral sessions and 9 poster sessions were presented in three days from December 3 to 5. Figure 1 is the photo of the opening ceremony. In the final day, December 5<sup>th</sup>, three workshops on EM education for students and young researchers were also held.

The plenary speeches were as follows,

- Prof. Makoto Ando (Tokyo Institute of Technology, Japan), "Antennas and Propagation for Millimeter Wave Compact Range Communication"
- Prof. Kwai-Man Luk (City University of Hong Kong, Hong Kong), "Recent Development of the

Table 1 Major statistics

Papers Submitted	363
Papers Accepted	341

Table 2 Number of accepted papers

Japan	110
Taiwan	97
China	38
South Korea	22
Malaysia	14
Indonesia	7
Germany	5
Hong Kong	5
India	5
Thailand	5



Fig. 1 Opening Ceremony



Fig. 2 Winners of the Student Paper Contest with Prof. Sarkar, President of IEEE AP-S

## Wideband Magneto-electric Dipole Antennas and Arrays for Wireless Communications”

Student paper contest was also held on the symposium. The three winners Mr. B. Chen (Feng Chia Univ., Taiwan), Mr. P. Lu (Tokyo Inst. of Tech., Japan), and Mr. H. Yi (Univ. of Electronic Science and Technology of China, China) were awarded at the banquet on December 4<sup>th</sup> as shown in Fig. 2.

### 2. ISAP International Steering Committee Meeting

The ISAP International Steering Committee (ISC) was established during ISAP2006 with 9 countries/regions. The mission of the committee is planning future ISAP and establishing operation rules to steer the symposia smoothly using international cooperation. Now the number has reached 12, Australia, China, Hong Kong, India, Japan, Korea, Macao, Malaysia, Singapore, Taiwan, Thailand, and Indonesia.

In the period of ISAP2014, ISC regular meeting was held. The operation of the symposium was discussed and future ISAP venue has been decided in the meeting. The ISAP-ISC has decided that the venue of ISAP2017 will be Thailand in this meeting. Thus the venues up to 2017 have been decided, Tasmania, Australia in 2015, and Okinawa, Japan in 2016.

### 3. ISAP Archives

ISAP ISC also set up ISAP Archives recording all papers presented at the previous ISAP. At this moment all papers from the first ISAP in 1971 to ISAP 2013 have been digitized and online, as a result everybody in the world AP community can access ISAP papers with free of charge. The archive is updated every year. This service will respond to expectations of AP specialists in the world and enhance motivations especially for Asian people to submit papers.

The URL of the ISAP Archives is “<http://ap-s.ei.tuat.ac.jp/isapx/>” and the top page is shown in Fig. 3. The site can also be reached through the web site of the IEICE Knowledge Discovery, I-Scover (<http://i-scover.ieice.org/>) shown in Fig.4. The papers of the latest ISAP will be archived almost a half year later after the ISAP. The papers of ISAP2014 will appear in the ISAP Archives in late June, 2015. In addition to the ISAP Archives, papers of recent ISAPs have also been included in IEEE Xplore.

### 4. Conclusion

ISAP2014 provided to contributors and participants an academic and friendship atmosphere for exchanging advances in AP research and strengthening relationship. Many young students also had a chance to discuss with the experts in their fields. The upcoming ISAP2015 will be held in Hobart, Tasmania, Australia, from November 9<sup>th</sup> to 12<sup>th</sup>, 2015. Deadline for paper submission is July 3<sup>rd</sup>, 2015. Please see the details in the ISAP2015 Web site shown in Fig.5 (<http://isap2015.org/>) and also Call For Paper shown in page 36 of this issue.

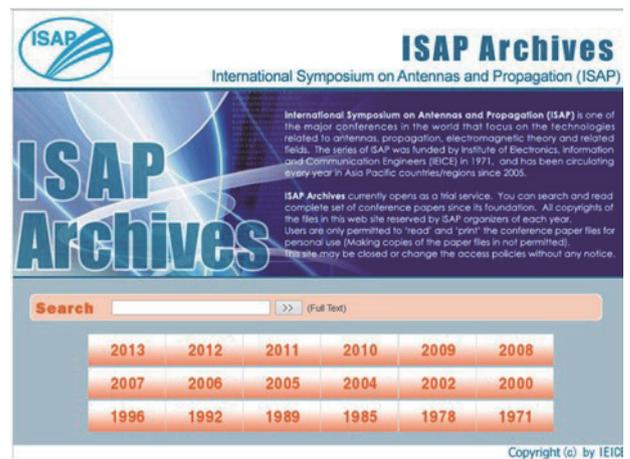


Fig. 3 ISAP Archives Web site (<http://ap-s.ei.tuat.ac.jp/isapx/>)



Fig. 4 IEICE Knowledge Discovery, I-Scover (<http://i-scover.ieice.org/>)



Fig. 5 ISAP2015 Web site (<http://isap2015.org/>)

# APRICOT-APAN 2015

Yoshinobu Matsuzaki  
Internet Initiative Japan Inc.



## 1. Introduction

The combined conference of the Asia Pacific Regional Internet Conference on Operational Technologies (APRICOT) [1] and the Asia Pacific Advanced Network (APAN) [2] meeting was held in Fukuoka, Japan, from 24<sup>th</sup> Feb to 6<sup>th</sup> Mar 2015. IEICE-CS Internet Architecture Technical Committee was one of the supporting organizations of this conference.

Since 1996, APRICOT has annually provided a forum for Internet builders in the region to learn from their peers and other leaders in the Internet community from around the world. APAN has held meetings twice a year to promote advanced research in networking technologies and the development of high-performance broadband applications.

This is the second combined conference following the first successful APRICOT-APAN 2011 conference that was held in Hong Kong in 2011.

## 2. Conference Overview

The 11 days conference consisted of seminars, workshops, tutorials, plenary sessions, conference sessions, working groups and birds-of-a-feather (BoF) sessions.

Other related organizations hosted their meetings co-locating with the conference as well. This time, the Asia Pacific Network Information Centre (APNIC) [3], the community of Asia Pacific Internet Organizations (APStar), DotAsia, the Trans-Eurasia Information Network (TEIN) project, the Asia Pacific Internet Exchange Association (APIX) and the Asia Pacific Top Level Domain Association (APTLD) hosted their member meetings and special events at the venue.

835 delegates from 54 economies attended on-site, and over 500 participants joined in remotely.

## 3. Plenary Sessions and Keynotes

The Opening Plenary was held in the Main hall at the Fukuoka International Congress Center. Philip Smith, the Chair of APIA, welcomed participants to APRICOT-APAN2015, stating that this was the 20<sup>th</sup> APRICOT. Sureswaran Ramadass, the Chairman of APAN board, thanked all efforts that made the conference happened. Paul Wilson, the Director General of APNIC, made welcome remarks, stating the history of APRICOT. Ryoichi Hosoya, the Chair of the APRICOT-APAN 2015 Executive Committee, welcomed participants to Fukuoka.

David Lassner, the President of the University of Hawaii System, gave a keynote speech entitled ‘Putting

the “P” into AP: Research & Education Networking for the Pacific Islands’. David described current network situations in the Pacific region, and highlighted the importance of high-speed connectivity for all sectors including the Pacific islands where we need more efforts today.

Elise Gerich, the Vice President of IANA at ICANN, made a keynote speech entitled ‘ABCs of Number Allocations’. Elise spoke about the Internet numbering registry system from historical prospective based on her experience of the Internet networking since 1987. Elise acknowledged some of the people who had leadership and vision in the early Internet, and emphasized that they created a partnership between industry, academia and government that has changed the way the Internet was able to grow.



Fig. 1 Opening Plenary

Ryugo Hayano delivered a keynote speech entitled ‘Internet use and disasters – lessons from the Fukushima Dai-ichi accident’ at the Closing Plenary. Ryugo started his address by saying the Fukushima Dai-ichi accident is the first nuclear accident in the Internet era. Ryugo stated ‘no electricity, no Internet’, and argued the government needs to improve skills of risk communication. Ryugo highlighted the power of social media that enable people connected.

## 4. Closing

APRICOT-APAN 2015 successfully finished its entire agenda. The APRICOT-APAN 2015 Executive Committee expresses gratitude for all the contributions and efforts to the conference.

## 5. Reference

- [1] APRICOT: <https://www.apricot.net/>
- [2] APAN: <https://www.apan.net/>
- [3] APNIC: <https://www.apnic.net/>

## IEICE-CS Related Conferences Calendar

Date	Conference Name	Location	Note
17 Nov. - 19 Nov. 2015	The 4 <sup>th</sup> ENRI International Workshop on ATM/CNS (EIWAC2015)	Tokyo, Japan	Submission deadline: Closed
9 Nov. - 12 Nov. 2015	2015 International Symposium on Antennas and Propagation (ISAP2015)	Tasmania, Australia	Submission deadline: 3 July 2015
18 Oct. - 22 Oct. 2015	37 <sup>th</sup> IEEE International Telecommunication Energy Conference (INTELEC 2015)	Osaka, Japan	Submission deadline: Closed
14 Oct. - 16 Oct. 2015	The 21 <sup>st</sup> Asia-Pacific Conference on Communications (APCC2015)	Kyoto, Japan	Submission deadline: Closed
4 Aug. - 7 Aug. 2015	10 <sup>th</sup> Asia-Pacific Symposium on Information and Telecommunication Technologies (APSITT2015)	Colombo, Sri Lanka	To be held <b>soon</b>
13 Jul. - 15 Jul. 2015	International Symposium on Ultrafast Photonic Technologies and Extremely Advanced Transmission Technologies 2015 (ISUPT/EXAT 2015)	Kyoto, Japan	To be held <b>soon</b>
7 Jul. - 10 Jul. 2015	International Conference on Ubiquitous and Future Networks 2015 (ICUFN 2015)	Sapporo, Japan	To be held <b>soon</b>
28 Jun. - 2 Jul. 2015	OptoElectronics and Communications Conference 2015 (OECC 2015)	Shanghai, China	To be held <b>soon</b>
28 Jun. 2015	OSA Advanced Photonics Congress 2015 Space-Division Multiplexing Workshop (OSA APC2015 SDM workshop)	Boston, USA	To be held <b>soon</b>
3 Jun. - 5 Jun. 2015	2015 IEICE Information and Communication Technology Forum (IEICE ICTF 2015)	Manchester, UK	To be held <b>soon</b>
13 May - 14 May 2015	Taiwan-Japan Workshop on SDN/NFV	Hsinchu, Taiwan	Done
23 Apr. - 25 Apr. 2015	2015 IEEE International Broadband and Photonics Conference (IBP 2015)	Bali, Indonesia	Done
25 Mar. - 27 Mar. 2015	The Twelfth International Symposium on Autonomous Decentralized Systems (ISADS2015)	Taichung, Taiwan	Done
24 Mar. - 26 Mar. 2015	2015 9 <sup>th</sup> International Symposium on Medical Information and Communication Technology (ISMICT2015)	Kamakura, Japan	Done
9 Mar. 2015	The 8 <sup>th</sup> International WDN Workshop on Cooperative and Heterogeneous Cellular Networks (WDN-CN2015)	New Orleans, USA	<b>Reported</b> on this issue
24 Feb. - 6 Mar. 2015	Asia Pacific Regional Internet Conference on Operational Technologies-Asia Pacific Advanced Network 2015 (APRICOT-APAN2015)	Fukuoka, Japan	<b>Reported</b> on this issue
2 Dec. - 5 Dec. 2014	2014 International Symposium on Antennas and Propagation (ISAP2014)	Kaohsiung, Taiwan	<b>Reported</b> on this issue

Please confirm with the following IEICE-CS web site for the latest information.  
<http://www.ieice.org/cs/conf/calendar.html>

## Special Section Calendar of IEICE Transactions on Communications

Issue	Special Section	Note
Jun. 2016	European ICT R&D Project Activities on Broadband Access Technologies in Conjunction with Main Topics of 2015 IEICE ICT Forum	Submission due: 31 August 2015 <b>See page 30</b>
May 2016	Internet Architectures and Management Methods that Enable Flexible and Secure Deployment of Network Services	Submission due: 15 September 2015 <b>See page 29</b>
Apr. 2016	Autonomous Decentralized Systems Technologies and Applications for Next-Generation Social Infrastructure	Submission due: 25 July 2015 <b>See page 28</b>
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	Submission due: 19 June 2015 <b>See page 27</b>
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
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	To be issued <b>soon</b>
Jul. 2015	Electromagnetic Compatibility Technology in Conjunction with Main Topics of EMC'14/Tokyo	To be issued <b>soon</b>
Jun. 2015	No special section in this issue	
May 2015	Recent Progress in Radio Propagation	Vol. E98-B, No.5
Apr. 2015	No special section in this issue	
Mar. 2015	Position Papers Exploring Innovative Intelligence and Technologies in Communications	Vol. E98-B, No.3

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

## **Call for Papers**

### **-- Special Section on Management for the Era of Internet of Things and Big Data --**

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Management for the Era of Internet of Things and Big Data" in Feb. 2016.

Smart devices like networked appliance and sensor, together with smartphone and tablet, are paving the way for the new era of Internet of Things (IoT) and big data. New value-added applications and services would emerge by means of huge amount of data sourced, stored and analyzed from everything connected to the Internet. This unprecedented era, demanding to cope with the huge amount of data as well as emerging devices and still ever-increasing networks and systems, will pose yet another challenge for management and operations arena. Thus, a special section is planned (scheduled to appear in the Feb. 2016 issue) to promote research and development of management for the era of Internet of things and big data. Many submissions are cordially encouraged.

#### **1. Scope**

This special section aims to identify the following topics for the era of Internet of Things (IoT) and Big Data:

- new management paradigms and architecture
- management theory (control theoretic management approaches, optimization and management methodologies)
- management functions (fault, configuration, resource, performance, security and privacy management)
- network management and operations (next generation network, overlays, virtual network, software defined network (SDN), network function virtualization (NFV) and content centric network (CCN))
- system management and operations (data center, cloud computing, virtualized system, smart grid, smart home, smart community, smart city and energy-aware operations)
- service and data management and operations (sensors, tags, RFID, big data, M2M and IoT)
- management models, management protocols and standardization
- implementation, prototyping and practice

#### **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 **June 19, 2015 (JST)**. Authors should choose the Management for the Era of Internet of Things and Big Data as a "Journal/Section" on the online screen. Do not choose [Regular EB].

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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>.

## -- Special Section on Autonomous Decentralized Systems Technologies and Applications for Next-Generation Social Infrastructure --

The IEICE Transactions on Communications announces a forthcoming section on "Autonomous Decentralized Systems Technologies and Applications for Next-Generation Social Infrastructure" to be published in **April 2016**.

The Autonomous Decentralized Systems (ADS), born in Japan 30+ years ago, have technologically evolved in communication networks, information systems, and control systems. It has been applied in many actual systems, and it has progressed in standardization activities. IEICE and IEEE published joint Special Sections on "Autonomous Decentralized Systems" in May 2000, Oct. 2001, Dec. 2005, Sep. 2008, and Nov. 2011 cooperating with the International Symposium on Autonomous Decentralized Systems (ISADS). ADS technology has been making tangible improvement, and innovative new research is being reported successively. In particular, it is expected that ADS technology is applied to applications to promote transformation of social infrastructures, including the smart grid, environment management, resilience of system, Internet of Things, autonomous car and train, communication among the mobiles.

The objective of this Special Section is to discuss new technologies in the extended field of Autonomous Decentralized System through papers. The Special Section solicits novel research results from ADS and its related fields including the extended results of what is presented in the International Symposium on Autonomous Decentralized Systems (ISADS 2015) in March 2015.

**NOTE: The same paper presented in ISADS 2015 cannot be accepted** because IEEE owns the copyrights to all papers in the conference proceedings. If it was originally appeared in ISADS2015, the submitted paper has to be **revised substantially**. It must have a different title and contain new results opening up new vistas. In this case, it is required to place a footnote indicating it clearly, for example, "This work is based on "(full title)", by (authors' names) which appeared in Proc. IEEE International Symposium on Autonomous Decentralized Systems (ISADS 2015), Taichung, Taiwan, March 2015, ©2015 IEEE."

### 1. Scope

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

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

### 2. Submission Instructions

The standard number of pages is 8. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guideline in the "Information for Authors." The latest version is available at the web site, [http://www.ieice.org/eng/shiori/mokuji\\_cs.html](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 **July 25, 2015 (JST)**. Authors should choose *Autonomous Decentralized Systems Technologies and Applications for Next-Generation Social Infrastructure* as a "Journal/Section" on the online screen. Do not choose [Regular EB].

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

## --- 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

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 **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].

#### Contact point:

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### 3. Special Section Editorial Committee

**Guest Editor-in-Chief:** Osamu Akashi (NTT Network Innovation Labs.)

**Guest Editors:** Fumio Teraoka (Keio Univ.), Hiroshi Yamamoto (Nagaoka Univ. of Tech.)

**Guest Associate Editors:** Katsuyoshi Iida (Tokyo Inst. of Tech.), Shingo Ichii (Univ. of Tokyo), Takao Okamawari (Softbank Mobile), Eiji Kawai (NICT), Kenji Saito (Keio Univ.), Takao Suganuma (Tohoku Univ.), Kazutoshi Fujikawa (NAIST), Kenji Fujikawa (NICT), Yoshiaki Hori (Saga Univ.)

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

## --- Special Section on European ICT R&D Project Activities on Broadband Access Technologies in Conjunction with Main Topics of 2015 IEICE ICT Forum ---

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on European ICT R&D Project Activities on Broadband Access Technologies in Conjunction with Main Topics of 2015 IEICE ICT Forum" in the **June 2016** issue.

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

### 1. Scope

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

- Information and communication theory and algorithms, 4G and beyond wireless cellular networks/wireless cooperative networks/wireless cognitive and reconfigurable networks, and related technologies,
- Socio-economic implications of new technologies, law/regulatory impacts of new network technologies, social networking, The Internet of Things and machine type communications,
- Next-generation wireline access technologies and networks (integration of optical and wireless access as a last mile, converged optical-wireless networks, power communication technologies, future broadband digital subscriber line (DSL) access, distributed monitoring and management techniques, channel modeling/measurement), and green communication,
- Performance measurements, experimental platforms and testbeds concerning to the above mentioned topics.

### 2. Submission Instructions

The standard number of pages is 8. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guideline in the "Information for Authors." The latest version is available at the web site, [http://www.ieice.org/eng/shiori/mokuji\\_cs.html](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 **August 31st, 2015 (JST)**. Authors should choose the European ICT R&D Project Activities on Broadband Access Technologies in Conjunction with Main Topics of 2015 IEICE ICT Forum 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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**Deputy Editor-in-Chief:** Haris Gacanin (Alcatel-Lucent Bell, Belgium)

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

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



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● **IEICE Societies and Publications**

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

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

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

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

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

NOTE

- You need to choose one Society, and you can subscribe Transactions online of your registered society.  
Example: If you want to subscribe to Transaction of EA, please check Society Registration as "A", and your membership fee amounts to 7,000 yen / 5,000 yen.
- If you want to register other Societies and Transaction of web version, please check "Additional Society registration".  
Example: If you want to subscribe to Transaction of EA and EB, please check Society Registration as "A", Additional Society registration (optional) as "B". Your membership fee amounts to 7,000+3,500 yen / 5,000+3,000 yen.
- If you want to subscribe to one Transaction of paper version, please check "Additional Transaction subscription (published in paper)".  
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Surface mail charge is included in the membership charge. Optional rapid mailing service is available by air mail or surface air lifted (SAL) mail. The additional charge per year periodical depends on the mailing address, as shown in the right table.

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

Please contact the IEICE Membership Section: E-mail: [member@ieice.org](mailto:member@ieice.org) FAX: +81 3 3433 6659 **Please fill out the application form printed on the reverse side of this page.**



# IEICE Communications Society - GLOBAL NEWSLETTER

## Submission Guideline

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

### 1. About GLOBAL NEWSLETTER

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

#### 1.1. Goal

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

#### 1.2 Category of Articles

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

### 2. Major notes for Contribution

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

#### 2.1 Template and Language

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

#### 2.2 Number of pages

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

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<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.

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##### 5.4 Submission of COPYRIGHT TRANSFER FORM

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Name: Publications Department, IEICE

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#### 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

### ● 20<sup>th</sup> Anniversary

My wife and I will be celebrating our 20<sup>th</sup> anniversary in this June. Our marriage changed our life so much. Besides that, anyway, it should be true that Internet and mobile phone have changed people's life in last 20 years. However, I wonder why the time to open files in a PC unchanged at the order of a few to tens of seconds and user interface of a major computer OS, one of its initial releases also having 20<sup>th</sup> anniversary this year, still make me struggle to find a right window that I have to work with. I hope the advent of next generation communication technology will contribute to improve QoE much more.

IEICE-CS GLOBAL NEWSLETTER Editorial Staff

#### Editorial Staff of this issue

No special order is observed



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*Director, International Publication, IEICE Communications Society*



# Call for Papers

## International Symposium on Antennas and Propagation (ISAP2015)



9-12<sup>th</sup> November 2015, Hobart, Tasmania, Australia

### ADVANCING ANTENNA AND PROPAGATION RESEARCH FOR A CONNECTED WORLD

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The International Symposium on Antennas and Propagation (ISAP) is the premium antennas and propagation conference in Asia-Pacific region. Under the technical sponsorship of IEEE and IEICE, the 2015 International Symposium on Antennas and Propagation (ISAP2015) will take place at the Wrest Point Hotel, Hobart, Tasmania, Australia. ISAP2015 will provide a forum for researchers, engineers and industry experts to present recent research breakthroughs, technical advancement and new findings in antennas and propagation. A particular focus of the conference will be recent advances in the context of the latest wireless communications and sensing systems. It will also offer an exciting social program in the picturesque Hobart.

#### Topics of interest for ISAP2015 include but are not limited to the following:

- Computational Electromagnetics
- Wireless Power Transmission
- Radio propagation
- Advances in MIMO Systems
- Antennas for Radio-Astronomy
- Antennas for Fixed and Mobile Satellite Communications
- Metamaterial and Nano-tube Based Antennas and RF Devices
- Antennas and Propagation for Wireless Sensor Networks
- mm-wave and THz Antennas
- Antennas and Propagation for Medical Applications
- Antennas for Base Stations and Handheld Devices
- Modelling and Simulations
- Smart Antennas
- Phased Arrays
- Broadband Antennas
- Wideband Antenna Arrays
- Conformal Antennas

Special sessions are being organised by prominent researchers.

#### Presented papers will be published in IEEE Xplore

Important Dates:

- 3<sup>rd</sup> July 2015
  - Paper Submission Deadline
  - [edas.info/N19239](http://edas.info/N19239)
- 17<sup>th</sup> July 2015
  - Tutorial session proposals due
- 28<sup>th</sup> August 2015
  - Notification of Acceptance
- 25<sup>th</sup> September 2015
  - Camera Ready Manuscripts Uploaded
  - Early bird registrations close
- 23<sup>th</sup> October 2015
  - Normal Registrations Close
- 9<sup>th</sup> November 2015
  - Tutorial Sessions
- 10<sup>th</sup> - 12<sup>th</sup> November 2015
  - Conference General Sessions
- 10<sup>th</sup> November 2015
  - Welcome Reception
- 11<sup>th</sup> November 2015
  - Conference Banquet

Conference Hotel:

- Wrestpoint Hotel, Hobart, Tasmania
  - <http://www.wrestpoint.com.au>
  - Reservation code ISAP15



ISAP2015.ORG