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Challenges and Approaches

Annual Report of Technical Committee on Network Systems

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1.Introduction

This report covers the annual activities of the IEICE Technical Committee on Network Systems (NS). It describes activities at the monthly technical meetings, recent research topics of the committee, and the research awards for 2009.

2.Technical meetings

The schedule from April 2010 to March 2011 consists of eight technical meetings and two workshops (Table 1). Several of these meetings are co-located with Optical Communication Systems (OCS), Photonic Network (PN), Radio Communication Systems (RCS), Communication Systems (CS) and Information Networks (IN), Information Communication Management (ICM), and Communication Quality (CQ) committees. In addition, the April technical meeting was co-sponsored by the International Teletraffic Congress (ITC) Japan Committee.

Recently, presented papers have mainly focused on technologies that support traffic control/measurement, quality of service (QoS), optical networking, ad-hoc and P2P networking, new generation networks, and security issues. At each technical meeting, we host lectures by invited speakers who are experts in their fields. During this fiscal year, we have had invited lectures on MPEG video encoding, service delivery platforms, traffic engineering, wireless multi-hop networking, real NGN, home networks, network virtualization, network simulators, SIP, cloud computing, and other topics. The number of papers presented at our meetings in recent years is shown in Fig. 1. In general, this number is increasing, and that from the telecommunications industry is also increasing.
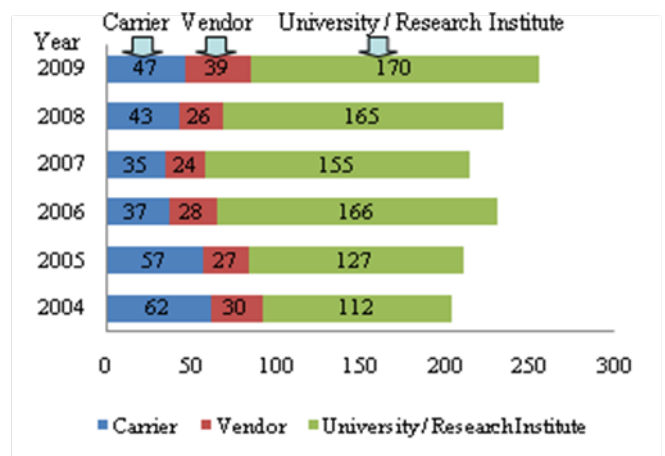

Fig. 1: Number of presented papers.

Table 1. Technical meeting schedule for fiscal 2010

Date	Location	Theme	Co-location with
Apr 15-16	Kagoshima University (Kagoshima)	Traffic Modeling, Network Evaluation, Performance Control, Traffic Engineering	ITC Japan Committee
May 20-21	Promotion of Machine Industry Hall (Tokyo)	Advanced Protocol and Network Control (Application level routing, QoS and Path Control, P2P, P4P, SIP), Network System Architecture (Interface, Hardware, Software)	
June 24-25	Akita University (Akita)	Photonic Network System, Optical Control, Optical Switching, WDM, Multi-layer, Next Generation Transport	OCS, PN
July 15-16	Abashiri City Hall (Hokkaido)	Fixed/Wireless Network, Hand Over, Distributed MIMO, Mobile Ad-hoc Network	RCS
September 2-3	Tohoku University (Miyagi)	Post IP Networking, Network Model, Internet Traffic, TCP/IP, Multimedia Communication, Network Management, Resource Management, Private Network, NW Security, etc	IN, CS
October 7	Makuhari Messe (Chiba)	Evolution of Network Technology - Next Generation Network and New Generation Network-	NwGN
October 21-22	Osaka University (Osaka)	Network Architecture (Overlay, P2P, Ubiquitous Network, Active Network, NGN, New Generation Network), Grid	
November 18-19	Kyoto University (Kyoto)	Network Management, NGN Architecture, NGN Operation, Traffic Modeling, QoS Measurement, Overlay Networks, NGN Service Quality, general areas	CQ, ICM
December 16-17	Okayama University (Okayama)	Mobile Ad-hoc Network, Ubiquitous Network, Wireless Communication, security, Multi-Access Network	
January 20-21	Kagawa University (Kagawa)	Network Software, Network Application, SOA/SDP, NGN, IMS, API, Grid	
March 3-4	Okinawa Convention Center (Okinawa)	General, NS+IN workshop (March 2-3)	IN

Since June 2003, we have fostered the work of young researchers who have presented papers at technical meetings by inviting them to give a follow-up talk some months later. We call these the "incentive lectures." We invited 12 young researchers to give such lectures in the past year, and we will continue this activity.

3.Research Awards 2009

The Technical Committee selected recipients of the Network System Research Award from 236 papers that were presented at monthly technical meetings from January to December 2009. The award is given to the authors of the three or four best papers of each year. The 2009 recipients attended the award ceremony at the IN/NS Workshop (Fig. 2) held in Miyazaki in March 2010. The abstracts of the four papers that won awards in 2009 are shown below.

Takayuki Goto, Teruyuki Hasegawa, and Shigehiro Ano: "A study on practical flow-based sampling method for observing flow statistics" [1]

Recently, as the amount of traffic through networks grows, the necessity of sampling has been increasing for analyzing the traffic data rapidly. Sampling is classified into packet-based sampling and flow-based sampling. The former has an advantage in that it is easy to implement and to use widely, but has a disadvantage in that the obtained precision of the flow statistics is bad. The latter has an advantage in that it is superior to packet-based sampling for measuring the flow statistics. However, it has a disadvantage in that only high-end routers/switches support flow-based sampling and the cost is high. This is due to flow-based sampling requiring per-packet processing to classify packets into flows, which is associated with high computational complexity.

In this paper, we propose a flow-based sampling method that utilizes the wildcard mask of the access list, which is supported by cost-effective general-purpose routers/switches. A group of packets can be extracted by using access list filtering, which can be based on IP address, port number, and/or protocol. Since "flow" is defined by IP address, port number, and protocol, this filtering retains the flow structure. For the filtering by IP address, we focus on the use of wildcard matching. Specifically, if each bit value "0" or "1" of an IP address is random and we assign N bit positions of the IP address and their "0" or "1" values, $1/2^N$ flow sampling may be achieved. Flow sampling with an arbitrary rate can be obtained by using multiple $1/2^N$ flow filterings. By applying the access list that is generated by the above-mentioned procedure to the switch, we perform a pseudo flow-based sampling.

Compared with a flow-based sampling by hashing, in the case of flows that were not sampled much, we confirm that our proposed method is effective for actual network operation.

Fig. 2: Research award recipients with chair Prof. Yamamoto.

Hiroyuki Funakoshi and Tatsuya Matsukawa: "An unavailability simulation of telecommunication networks based on the actual outage data" [2]

Reliability management for IP networks constructed of commercial equipment is important, and we have established management measures using actual outage data. As a next step, the results of the measures need to be reflected in the development of next generation networks and equipment.

In this paper, we propose a method to simulate the unavailability of telecommunication networks. The features of our proposed method are to model some reliability measures mathematically and to generate pseudo outage data with random numbers. We validate the reproducibility of the simulation and the accuracy of our mathematical models by comparing the simulation results to the actual unavailability in an IP network.

Pratama Putra and Akihiro Nakao: "Measuring peer-to-peer network topology through geo-location-aware distributed crawlers" [3]

Network topology information of peer-to-peer networks is useful for improving their performance as well as for generating an accurate model of topologies for simulations. Unfortunately, dynamic behaviors of peers such as joining and leaving make it difficult to obtain accurate network topology information.

In this paper, we propose a method to accurately measure the topology of a Winny network even under heavy churns by observing search queries through geographically distributed crawler systems. Our method achieves high completeness of measurement with various techniques for distributed crawling based on the geographical locations of Winny clients. We also show that a tree-structure crawling architecture is more effective than a single server system using a queuing model and simulation.

Yugo Horie, Chihiro Hirata, Shiro Futaki, Hirobumi Watanabe, and Takumi Miyoshi: "Implementation and evaluation of multi-hop streaming delivery method on Bluetooth" (incentive talk) [4]

Bluetooth has been becoming popular as a wireless communication method for mobile phones and audio players. However, Bluetooth products are limited to one-hop communication as an alternative to wired transmission – it is difficult to implement the specific communication mechanisms. In this paper, we propose a novel multi-hop relaying method on Bluetooth. The method successfully solves the frame loss problem existing in the previous mechanism we proposed. We implement a mechanism for confirming the end-to-end transmission to the audio/video distribution transport protocol (AVDTP), which defines audio/video stream negotiation, establishment, and transmission procedures on point-to-point connections between a sender and a receiver. For the implementation of transmission confirmation, we use an existing command, `AVDTP Suspend`, instead of employing a new one, while it is essentially used for suspending data transfers. A sender transmits a data frame to a receiver in a multi-hop manner. Once the frame reaches the receiver, an `AVDTP Suspend` is sent back and relayed to the sender. Until receiving the `AVDTP Suspend` for the previous frame, the sender waits to send the next frame of data.

We implemented the proposed method on computers and evaluated it for frame loss and throughput performance compared with the previous one. The results show that the frame loss rate is drastically improved and that multi-hop audio streaming is successfully achieved. However, the throughput becomes worse due to the end-to-end acknowledgment mechanism. We will continue to study how to improve the performance.

4. Future Plans

The Technical Committee will organize open symposia at the IEICE Conferences, one of which will be on "Network control and management technologies for next generation ICT infrastructure" at the IEICE Society Conference in September 2010.

  (For more information, please see our home page.
  URL: http://www.ieice.org/cs/ns/index.html)

References
[1] T. Goto, T. Hasegawa, and S. Ano, "A study on practical flow-based sampling method for observing flow statistics," *IEICE Tech. Rep.*, NS2009-30, May 2009.
[2] H. Funakoshi and T. Matsukawa, "An unavailability simulation of telecommunication networks based on the actual outage data," *IEICE Tech. Rep.*, NS2009-83, Oct. 2009.
[3] P. Putra and A. Nakao, "Measuring peer-to-peer network topology through geo-location-aware distributed crawlers," *IEICE Tech. Rep.*, NS2009-96, Oct. 2009.
[4] Y. Horie, C. Hirata, S. Futaki, H. Watanabe, and T. Miyoshi, "Implementation and evaluation of multi-hop streaming delivery method on Bluetooth," *IEICE Tech. Rep.*, NS2009-133, Dec. 2009.

Report on the 12th IEEE/IFIP Network Operations and Management Symposium (NOMS2010)

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1. Introduction

The 12th IEEE/IFIP Network Operations and Management Symposium (NOMS 2010) was held 19-23 April 2010 at the Osaka International Convention Center, Osaka, Japan, chaired by Nobuo FUJII (NTT-AT, Japan), and James Won-Ki Hong (POSTECH, Korea). Technical committee on information and communication management of IEICE (ICM) strongly supported the symposium. The organizing committee members such as General Co-Chairs, TPC, Application Session, Panels, Patron, Exhibits, Publication, Finance, Local Arrangement and Publicity Co-Chairs and Secretary were active ICM members.

2. Main topics in NOMS 2010

On the first day of NOMS 2010, Mr. Noritaka Uji, Sr. Executive VP, NTT CTO and CIO, Japan and Dr. Hideo Miyahara, President of NICT, Japan made keynote speech. Mr. Uji gave attractive topics on "Toward the Broadband & Ubiquitous Society" from a view point of telecommunications industry and network operation technologies. Dr. Hideo Miyahara talked remarkable research strategies titled "The Concept of a New Generation Network". Other four keynote speakers from the ICT industry also presented impressive research and development activities. Those who interested in these keynotes, please reference presentation materials posted on the official web site [1].

Technical sessions provided recent research activities such as IT management, Traffic and Resource management, Cloud management, Distribution systems, WLAN and ad hoc networks, Virtualization, Radio and hardware management. NOMS 2010 also provided many types of sessions: 1) 8 tutorial sessions, 2) 6 workshops, 3) 3 application sessions describing experience in IT and telecommunications industry, 4) 8 mini conference sessions, 5) poster sessions providing insights into work-in-progress, 6) panel sessions focusing on business implications, market trends, and emerging applications, and 7) exhibitions showcasing the latest solutions from vendors and demonstrations of the the latest services and prototypes.

3. Statistics

About 370 people from 30 countries registered for NOMS 2010. Authors from 34 counties submitted a total of 201 full papers. The technical program committee accepted 54 papers for 16 technical sessions reflecting acceptance rate of 26.9%; in addition, from the remaining 146 papers, 30 papers were selected for 8 mini-conference sessions.

4. Contingency Plan on International Conference

Unfortunately, many registrants from Europe and some from Brazil (who had connecting flights from Europe) could not attend in person due to volcano eruption in Iceland. However, most of these people managed to present their work via Skype, etc. This experience shows us that even if a presenter or chair could not attend the session, video and voice conferencing is feasible to keep and manage the session.

References

[1] NOMS web site, http://www.ieee-noms.org/2010/
[2] IM web site, http://www.ieee-im.org/

Fig.1 Keynote Speech

Fig.2 Banquet

Technical Committee on Software Radio 5th-year

Satoshi Denno (Kyoto Univ.), Kanshiro Kashiki(KDDI), Tatsuaki Hamai(KDDI Labs), Masayuki Ariyoshi(NEC), Takeo Fujii(UEC), Kenta Umebayashi(TUAT)
Technical Committee on Software Radio

1.Introduction

Technical Committee on Software Radio (TCSR) has promoted research on software radio, cognitive radio, and their related technologies since 1999. It was third year of TCSR since it was restructured to a permanent committee of IEICE in 2005. The steering committee members of TCSR in 2009 are shown below:

Chair:　　　Kazuhiro Uehara (NTT)
Vice Chair: Yukitoshi Sanada (Keio Univ.),
　　　　　Kei Sakaguchi (Tokyo Inst. of Tech.)
Secretary:　Takeo Fujii (Univ. of Electro-Commun.)
　　　　　Kenta Umebayashi (Tokyo Univ. of Agliculture and Tech.)
Assistant:　Goh Miyamoto (NICT)
　　　　　Seiichi Hanaoka (Hitachi)
　　　　　Suguru Kameda (Tohoku Univ.)

TCSR organized five technical conferences, and a special section on the Transactions in fiscal year of 2009. This article summarizes the latest activities of TCSR.

2. The 1st technical conference in May 2009 (Cognitive/Software radio and Joint SDR forum and IEICE TCSR-workshop)

- ✓ Date : May 28-29, 2009
- ✓ Place : Igarashi campus of Niigata university.
- ✓ The number of presentations: 21 (4 invited presentations, 10 presentations at the special session on spectrum sensing, 7 presentation on other topics)
- ✓ The number of participants: 90

General information

The SR technical meeting was held in Niigata city where we can enjoy tasty foods and wonderful drinks.

In the meeting, many spectrum sensing techniques were presented as well as techniques on other topics related to the software defined radio. Especially, there were 10 presentations about the spectrum sensing and deep discussions about them. In addition, 4 invited speakers had the presentations on interference detection and avoidance. On the other hand, John Chapin of the SDR forum and Tomoyuki Ohya had the presentations in the Joint SDR forum and IEICE TCSR-workshop described above. The detail is written as follows.

General Session

The lab. of Osaka university presented a technique which can reduces interference with the concept of "Dynamic spectrum access" in cognitive wireless networks. The research group of the ATR had the presentation about a transmission technique which aggregates some discrete empty frequency bands for broadband wireless communications. The joint research group of the NEC and the university of electro-communications proposed a protection criterion to keep the primary users from interference. The lab. of Yokohama national university presented research activities on the topic of cooperative interference reduction by the 4G mobile network and the ultra wide band wireless access. The NICT informed their research activity in which some devices crucial for cognitive base stations were developed. The lab. of Keio university proposed a technique that is able to estimate the DC offset and I/Q imbalance eve in the presence of the frequency offset. A synchronization technique in MIMO-OFDM bidirectional wireless networks was proposed by the lab. of Tokyo institute of technology.

Special sessions

The specialists in the research field related to the cognitive radio had the presentation as follows.
・S.Sasaki(the Niigata university)" Standardization Activities on Wireless Communication Systems Operating over TV Whitespace in IEEE802 "
・ M. Itami (Tokyo university of science)"Detection and Avoidance of Interference between UWB and Co-existing Communication Systems "
　・ C. Sun (NICT) "Spectrum Sensing for Cognitive Radio Systems -- Technical Aspects and Standardization Activities, Part I --"
　・ Y. D. Alemseged (NICT) "Spectrum Sensing for Cognitive Radio Systems: -- Technical Aspects and Standardization Activities, Part II --"

Special session on spectrum sensing

The lab. of Tohoku university informed the performance of the system that selects a more reliable signature wave form from those of single carrier systems and multicarrier systems, according to the channels state information. The research activity about spectrum sensing with the use of the covariance matrices in IEEE 802.22 was reported by Niigata Univ. The lab of NTT informed of the trial hardware that makes the cooperative sensing with the reliability of the

information from each sensor. The joint research group of Tokyo university of science and the university of electro-communication informed the performance of the stream detector which detects the number of the streams in MIMO spatial multiplexing. The professor of the Nagoya university proposed a technique that fixes the troubles caused by the defects in the link between the fusion center and the wireless access points. The lab of Keio university proposed a technique that detects the IFDMA signals by using the cyclostationarity. In addition, signal detection methods by using multiple antennas and DFT filter banks were proposed by Tokyo university of agriculture and technology and Tokyo institute of technology, respectively. Also, design methodology of the cooperative sensing was reported by Tokyo university of agriculture and technology.

Joint SDR forum and IEICE TCSR-workshop

J. Chapin and T. Ohya, which are very active in the research field of the cognitive radio and software defined radio, were invited to talk on the following topics.
・ J. Chapin (the SDR forum) "Feature Detection in Radio Technology".
・ T. Ohya and al. "R&D activities on radio resource control technologies among multiple radio systems on same frequency band".

3. The 2nd technical conference in July 2009 (Technical Exhibition)

✓ Date : July 29- 30, 2009
✓ Topics : 10-Year Memorial Event and Technical and Products Exhibitions
✓ Venue : Tokyo Institute of Technology
✓ Number of papers : 22 (Chairman's lecture : 4, Memorial lecture : 2, Invited lecture : 2, Regular paper : 9, Technical exhibition : 5)
✓ Number of Technical Exhibitions : 13
✓ Number of Products Exhibitions : 6
✓ Number of participants : 191

Introduction

The second SR technical conference was held at Tokyo Institute of Technology1, in O-okayama, Tokyo, from July 29 to 30. Ten years have passed since its time-limited technical conference was founded in 1999. To mark this occasion, we have two days of conference including memorial events. On the first day, there were oral presentations of five technical exhibitions, the technical and products exhibitions, which were constantly held in the SR technical conference and the special lectures by four successive committee chair persons as a memorial event. There was also a general session of nine papers, the invited lecture of two papers and the memorial lecture of two papers.

On the first evening,a lively party was held to maintain the air of excitement of the four chair person's lectures. In the party,the steering committee members expressed their intentions to activate the SR conference.

Technical Exhibition and Products Exhibition

There were 13 technical exhibitions and 6 products exhibitions. Before the start of the exhibition, a short oral introduction of exhibited articles was given in interview style so as to be understood by the attendees. Figure 1 shows a photograph of a presentation at the technical exhibition. There were not only presentations but also many discussions among the presenters and attendees.

Technical exhibitions included sampling point selection in a fractional sampling OFDM receiver, a wide variety of flexible wireless systems, development of cognitive wireless clouds systems, R & D platform for Software Defined Radio (SDR), design and measurement of harmonic rejection direct sampling mixer, design and implementation of a cognitive radio based emergency sensor network in disaster area, test-bed of cooperative heterogeneous radio networks for reliability enhancement, prototype of heterogeneous type cognitive radio system, prototype of spectrum sharing type cognitive base station, FIR filter design using SPT terms and its application to implementing SDR receivers, multi-channel two-way multi-hop relay network hardware prototype, FPGA implementation of transmit beam-forming in IEEE 802.11n, and Software Radio for the relay function of different wireless systems and for the disaster prevention.

In the products exhibition, each product was introduced by the venders. The hardware and software products regarding the SDR and the Cognitive Radio System were exhibited and demonstrated.

General Session

There were 9 presentations in the general session on the second day. Several presentations on the important technologies were introduced, which included optimum insertion / deletion point selection for fractional sample rate conversion, modulation identification with mean variance in CDMA system, fractional sampling OFDM system with delay diversity, image-band interference cancellation for multi-mode / band receivers with baseband AGC, performance analysis of overlap FFT filter-bank for Dynamic Spectrum Access, transmission scheme of cognitive radio system with power control over Rayleigh fading, auxiliary control channel for spectrum sensing in cognitive radio systems, product of rack-mount type SDR, and estimation method of channel occupancy ratio for wireless LAN.

10-year memorial event

In the 2nd conference, the 10-year memorial event was organized. In the afternoon of the first day, we had

the memorial lectures of four successive committee chair persons (refer to Fig.2). In the lecture, there were some interesting talks which could rarely be heard, such as episodes of failure and regret and the desire for the SR conference.

Professor Kohno, the first successive chair, stated that recent paper presentations were insufficiently balanced between software (information engineer) and wireless technology (electric engineer), in comparison with the target study items towards the SDR and Cognitive Radio System (CRS) at the time when the SR conference was founded. Additionally, he pointed out the lack of the former study item. Furthermore, he described, in Japan, the concern that there is no strategic research and development as seen in the USA. Finally, eight research fields of the ICT that Japan should promote in the future, were listed such as vertical converged wireless technology and scalable wireless technology.

Dr. Harada, the second successive chair, described the difficulty and efforts involved in the chair task. Then he addressed the future trends of wireless technology and the required technology to achieve level of the full member of society, while focusing on the high relevance between the promotion of wireless technology and the human growth process, which was a unique theme in such a technical conference.

Prof. Takada, the third successive chair, spoke first on all the soft topics such as the good points of the SR conference. Then he pointed out some difficulties of the second use issues in the TV band, which is drawing attention in the activities of the USA. He also noted the necessity of the political promotion to put it into practical use, since the study items of co-existence discussed in the ITU-R are exclusive provisions as a matter of practice. He pointed out the substance of the standardization activities, which was very helpful and interesting for the engineers who are not familiar with such fields.

Dr. Uehara, current chair, introduced the history of award planning and the technical exhibition. He also gave a policy speech on the future activation of the SR conference, which includes the new approach to establishing the sub-committees and the continuous execution of fresh theme planning, the technical exhibition and lively party.

As a memorial lecture, Prof. Suzuki gave a speech regarding the development activities of the SDR in the 2000's from the viewpoint of the realization and practical aspects, which includes some interesting episodes. As for the co-existence issues of wireless systems, he said that the technology moves (or should move) from the countermeasures for the interfered issues to novel scheme not to give harmful interfering.

Consecutively, Prof. Araki gave a lecture entitled "Impact of digital RF technique on SDR transceiver design". He discussed RF technology indicating that the CMOS sub-micron technology is absolutely necessary.

In addition, as a part of the 10-year memorial event, the history of the SR conference, prototype of the SDR and the list of the Technical Committee on SR (TCSR) award winners were displayed.

Invited lecture

We had two interesting lectures on the present status and future status regarding the SDR and RF elements necessary for the Cognitive Radio System.

Prof. Hashimoto addressed the subject of mobile terminals, claiming that the total performance could be achieved by means of the mutual complement of SDR and RF filter. Prof. Masu gave a lecture regarding the technical issues of the RF CMOS integrated circuit. In the SR conference, there are fewer contributions regarding the circuit issues. The lectures were useful and interesting, since all conference members recognize the importance of such circuit technology.

Fig. 1: Technical exhibition

Fig. 2: Four successive committee chair persons (from left to right) Dr. Uehara, Prof. Takada, Dr. Harada, Prof. Kohno

4. The 3rd technical conference in October 2009 (Workshop on Wireless Distributed Networks cosponsored with AN and USN)

✓   Date：Oct. 22-23, 2009

✓ Topics : Wireless Distributed Networks, Night session, Invited presentation
✓ Venue : Tohoku University
✓ Number of papers : 23（Invited papers: 3, Regular papers: 23 ）
✓ Number of participants : 166 (1st day 95, 2nd day 71)

The 3rd technical conference on October of TCSR was held in Tohoku university with jointly organizing among TCAN (Ad-hoc Network) and TCUSN (Ubiquitous Sensor Network) and TCSR. This conference is the second workshop on wireless distributed networks on this field by jointly organizing three TCs. In the first day, there were 1 invited lecture and 7 general presentations. At the night of the first day, night session was organized in the hotel Crescent, Akiho hot-spring resort. In the second day, there were 2 invited lectures and 9 general presentations.

General Session

There were 7 presentations in the general session on the first day. The AM-PM characteristics of low noise block converter was reported by NTT DoCoMo. An evaluation of spectrum sharing with transmit power control based on the outdoor experimentation was presented by NTT DoCoMo and Panasonic Mobile Communications. From Kyoto university, an evaluation of cognitive radio system with cooperative sensing based on field trial is reported. MAC protocols for distributed sensing were presented by NICT. Performance evaluation of fractional sampling OFCDM system with alternative spreading code was introduced in multiuser environment by Keio Univ. A development of spectrum sensing system with GNU radio and USRP was presented by Tokyo Inst. of Tech. An experimental validation of adaptive wireless baseband radio was presented by the Univ. of Electro-Comm.

On the second day, the conference was organized as wireless distributed networks session. An investigation of sensing level for spectrum shared cognitive radio and performance evaluation of raptor codes for cognitive radio over CSMA networks were reported by the Univ. of Electro-Commun. From Kyoto univ., optimal relay position of bi-directional cooperative relaying under asymmetric traffic conditions and study of Self-organized interference management for spectrum sharing were presented. A study on spectrum sharing by cognitive MIMO mesh network and Performance analysis of mesh network introducing 2D MIMO network coding were presented by Tokyo Univ. of Agr and Tech., the Univ. of Electro-Commun., Tokyo Inst. of Tech. and Yokohama National Univ. From Osaka Prefecture Univ., Osaka Univ. and Fuji Electric Systems, performance improvement by collision avoidance mechanism in receiver-driven multi-Hop wireless networks is reported. Performance of cooperative HARQ with relay selection that exploits

inter-relay opportunistic listening was presented by Keio Univ. and Tokyo Univ. of Science. From Tohoku Univ., a study on reducing power consumption of realtime positioning and data communication terminal for 5 GHz band wireless sensor networks is presented. A note on joint decoding of correlated data observed by multiple sensor nodes was reported by Nagoya Univ. From Tokyo Inst. of Tech. and Nihon Dengyo Kosaku Co., Ltd., hardware prototype for two-way multi-hop relay network with network coding was introduced. Study on layered adaptation control in sensor-overlay networks was presented by Osaka Univ. Keio Univ. presented analysis of collision avoidance scheme in MB-OFDM with time spreading.
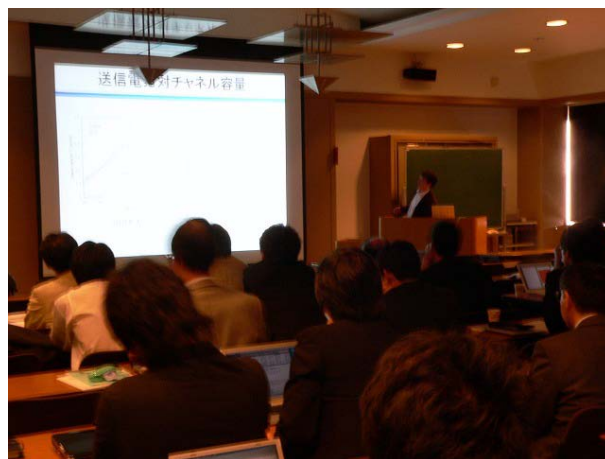
Fig. 3: Presentation at Wireless Distributed Networks session

Invited lectures

In this conference, one invited speaker is selected from each of organized technical comittee. Then totally three invited spearkers present the latest hot topic related to wireless disributed networks.
TCSR invites Prof. Eisuke Kudoh (Tohoku Inst. of Tech.). He presented about multi-hop virtual cellular network for high speed wireless network.
TCAN invited Prof. Nei Kato from Tohoku University and he had a presentation about the latest research and practical application on ad-hoc network. Finally, TCUSN invited Prof. Naoki Masuda from the Univ. of Tokyo and he presented the effects of hierarchical structure of complex networks on the measurement of PageRank in the World Wide Web.

His presentation title is "Regional Protection System using a Wireless Ad-Hoc Network." He presented a wireless network contributing to a regional safety system. TCRCS invites Prof. Hidekazu Murata from Kyoto University. His presentation title is "Transmission Techniques for Distributed Cooperative Communication in Wireless Networks." He presented the latest research topics about cooperative distributed wireless communication networks in which plural distributed terminals are cooperated together for improving the communication performance. Finally,

TCUSN invites Prof. Shiro Tamaki from the University of Ryukyu. His presentation title is "Remote Sensing and Control System based on ICT, and the Practical Use Plan to the Agriculture." He presented information and communication technologies based on Okinawa community. There were very impressive presentations and the audiences have gotten a lot of stimulation from the presentations by different fields.

Night Session

At the night session, delegated presentator of each TC had presentation about their interesting topic. Since they offerred very unique topics, the session was really exciting.

From TCUSN, Prof. Norihisa Segawa (Iwate Prefectural University) had a presentation about an experiment of ubiquitous sensor networks in mountain near by settlement. They found several ways to use sensor network by collaborating with the researchers in agriculture field. A biological research of deers with embedded RFID was reported.Their one of next goals is biological research of bears.

From TCAN, Prof. Shisuke Hara (Osaka City Univ.) had a presentation about what are we going to do with wireless. He presented thought-provoking things by quoting the words of Prof. Shinya Yamanaka and his father as follows: "Do not same things which are done by other people", "Commentator shuold not be a lifetime work for men", "A target for a researcher should be writing a paper whose citation count is more than 1000.", "Interesting thing is important but only interesting is not enough." and "Consider the wireless 20 years after" etc.

From TCSR, Dr Teruya Fujii (Softbank Telecom) had a presentation with a title "To understand cognitive radio". He had asked several significant questions about cognitve radio to the audiences from the viewpoint of carrier. It has been concluded that a standard of a new wireless ssytem with cognitve radio techniques should be conducted for a development of cognitve radio techniques.

Fig. 4: Dr. Teruya Fujii and Prof. Sakata, Dr. Uehara and Prof. Mase at the night session
(from left to right)

Fig. 5: Night session was organized in Hotel Crescent

5.The 4th technical conference in January 2010

✓ Date: 21st – 22nd, January, 2010
✓ Venue: The University of Electro Communica-tions, Tokyo
✓ Number of papers: 18 (Invited papers: 5, Regular papers: 13)
✓ Number of participants: 99
✓ Focused topics: Cognitive Networks, International Workshop

General Sessions

A number of research outcomes were presented, mainly on cognitive radio and cognitive networks.   On the first day, a variety of presentations were made in the area of cognitive networks from physical layer transmission technologies to network control and system performance evaluation.   Those were: a proposal of optimal traffic distribution control for heterogeneous wireless link aggregation (Tokyo Univ. Science / NICT); a study on spectrum sharing in which a secondary system relays primary signals (Nagoya Univ.); a proposal of modulation classification method for multiple signals (Osaka Univ.); a proposal of combined Nyquist and compressed sampling for multiband receivers (NTT); a throughput evaluation of a cognitive radio system with cooperative sensing (Yokohama National Univ.); a feasibility study of transmission schemes for low power broadband system with wide area coverage (Niigata Univ.); a study on impacts of receiver physical configuration on white space occurrence in multi-BSS / multi-channel WLAN operation (ATR); and a proposal of data transmission procedure for a dynamic spectrum access system in ISM band (ATR).

On the second day, a session featuring spectrum sensing was organised.   The presentations were: an evaluation of spectrum sensing with nonlinear front end (Tokyo Univ. Science/Univ. Electro-Commun. / Keio Univ.);   a   proposal   of   an   iterative

cyclostationarity-based feature detection for multiple primary signals (NTT Docomo); a proposal of low-complexity cyclostationarity feature detection for UWB-DAA (Keio Univ.); a proposal of hidden terminal protected routing using sensing for multi-hop wireless mesh networks (Univ. Electro-Commun.); and a study on the coexistence of cognitive radio systems based on a parameter of Quality of Coexistence (NICT).

Special Programme

In the afternoon session on the first day, a special programme was held. First, an invited talk "The evolution of digital signal processing in wireless communications" was delivered by Prof. Yoshihiko Akaiwa from the Univ. Electro-Commun. The talk overviewed the history of technical innovations in wireless / mobile communications and his remarkable achievements of research and development activities, including developing technologies, standardisation, and services. There were audience of students, who seemed to be very much inspired.

Next, a special talk "Commercial release of mobile router with cognitive functionality" was given by Dr. Takehiro Ikeda, TripletGate, Inc. He introduced their commercial services of wireless networking as well as their new planned product, a cognitive router. He explained that the product has functionality specified in IEEE 1900.4 standard, by which users can get WiFi internet connection without recognising actual link of 3G / WiMAX / public WLAN, etc. It drew much attention, where a number of questions were raised not only from technical viewpoints but also from user point of view.

International Workshop

TCSR has regularly organised international workshops aiming interaction and information exchange with major organisations and projects in relevant topics. For this time, an international workshop was held in the afternoon session on the second day, where three invited talks were delivered from cognitive radio related projects in Europe and Japan.

The first was on a European FP7 project E^3, End-to-End Efficiency in cognitive radio systems. The presenter was Mr Vincent Mérat, from NEC Technologies (UK) Ltd. Since E^3 project had been completed by December 2009, major outcomes from the project were presented: Cognitive Pilot Channel (CPC); Cognitive Control Radio (CCR); and Spectrum Sensing; as three Cognition Enablers. There was a lively exchange of opinions regarding technical points as well as related standardisation at ITU-R and ETSI.
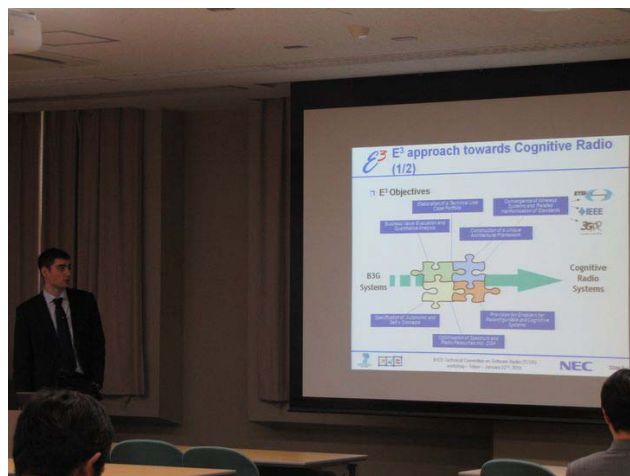

Fig. 6: E3 presentation at the international workshop

Two presentations from Japan side (KDDI R&D Labs and ATR) followed: those are conducted by a project, Research and development for reliability improvement by the dynamic utilisation of heterogeneous radio systems, which is ordered by the Ministry of Internal Affairs and Communications, Japan. From KDDI R&D Labs, Dr Kanshiro Kashiki, as an alternate presenter for Dr Toshinori Suzuki, introduced a testbed for heterogeneous wireless system they have developed. He also briefly mentioned about the latest topics on cognitive radio in ITU-R. Dr Tetsuro Ueda from ATR gave a presentation on public-private cooperative cognitive radio access networks they have proposed. Study results of component key functions of the system were highlighted: dynamic channel allocations, power control, access point selection, and traffic distribution. System integration aspects were also shown.

6.The 5th technical conference in March 2010 (Workshop on Mobile Communications cosponsored with TCs on AN, MoMuC, RCS)

- ✓ Date：March 4-6, 2010
- ✓ Topics：Workshop on Mobile Communications
- ✓ Venue：Yokosuka Research Park
- ✓ Number of papers：119 (TCSR 21: Organized papers: 6, Regular papers: 15)
- ✓ Number of participants：355 (1st day 130, 2nd day 140, 3rd day 85)

The SR technical conference on March was held at YRP (Yokosuka Research Park) from March 3rd to 5th cosponsored with TCs on AN, MoMuC and RCS as Workshop on Mobile Communications. In this year, totally 126 papers were presented during three days. The number of the presentations from TCSR was 21 including 5 organized papers. The organized papers are invited based presentations of the field of recent active research topics discussed in TCSR in this fiscal year. Active discussions were also performed at the regular session with high quality 16 papers. From this year,

four technical committees jointly organized special session on "Heterogeneous Networks."

Organized Regular Session

Every year, TCSR prepare "organized regular session" by collecting the key topics focused in this fiscal year in TCSR. The papers in this session are invited by the organizing members of TCSR. This year, we invited five presenters for introducing selected advanced topics in TCSR research fields. The first presenter is Prof. Sasaki, from Niigata Univ. He introduced standardization of white space type cognitive radio, in which a secondary system shares the spectrum allocated to the primary system. In this presentation, the standardization of TV white space in United States, England and Europe countries were reported. The standardization discussed in IEEE 802 meetings was also introduced. The second presenter is Prof. Kim, from Tokyo Institute of Tech. He introduced spectrum sensing methods for cognitive radio. The main topic of this presentation is cyclostationary signal detection, which is known as high reliable sensing technology. The third presenter is Dr. Ishizu, from NICT. He summarized standardization of cognitive radio at ITU-R and IEEE P1900.4. The recent activities of ITU-R targeting for WRC-12 which will be held on 2012 are presented. Definition of architectures for cognitive radio discussed at IEEE P1900.4 was reported. The fourth presenter is Prof. Ibi, from Osaka Univ. He introduced a spectrum sharing technologies among multiple nodes at wireless distributed networks. The clear definition of wireless distributed networks and a novel spectrum sharing method with permitting the interference among nodes. Last presenter is Mr. Shiba, from NTT. He reported trends for implementation and targeting to the commercialization of software define radio and cognitive radio. He introduced developing situation of software define radio and cognitive radio equipments in the world. A large number of audiences was participated in this organized session and actively discussed.

General Session

16 regular papers were presented in the first day and the second day of workshop. On the first day, seven papers about spectrum sharing cognitive radio systems with latest research results considering standardization were presented from NICT. The topics of presentations are a design of cognitive radio system, a database for sensing, a spectrum sharing manager, an access method, and so on, targeting to the spectrum sharing cognitive radio. Basic technologies for realizing spectrum sharing cognitive radio were reported. As a last presentation of first day, a study on observation time for detecting the primary system targeting the white space based wireless LAN was presented from Niigata Univ.

Eight papers from various fields from hardware technologies to spectrum sharing in cognitive radio

were presented in the second day of this workshop. In the morning session, a power control for spectrum sharing of cognitive radio by estimating the modulation level was proposed from Tokyo Univ. of Science. Implementation issues for model by using dynamic reconfigurable processor were presented from Toshiba. A study on spectrum sharing based on a minority game was presented from Kyoto Univ. A research for analyzing Wireless LAN transmitting situation by correlating the packet level information and signal level information was presented from ATR. In the afternoon session, experimental results for spectrum sensing were reported from Kyoto Univ. A study of adaptively selecting spectrum sharing methods between secondary systems was presented from Univ. of Electro-Communications. A study on adaptive multilevel modulation technique and adjacent subcarrier usage for spectrum sharing in OFDM type cognitive radio were presented from Keio Univ.

Special Session on Heterogeneous Networks

In the last day of this workshop, four TCs jointly organized the special session on heterogeneous networks. The joint session with four TCs was the first trial from this year. This special session called for papers in the specific topic without limitation of TCs. In this year, the topic is heterogeneous networks, which are the networks considering multiple and diverse wireless systems together. Totally, 14 papers were presented in this special session. From Osaka Univ., wireless distributed networks focusing on heterogeneous networks were presented. A study on wireless smart grid was presented from Tokyo Institute of Tech. NTT DoCoMo and Kyocera report the researches of heterogeneous networks on LTE. Heterogeneous cognitive radio technologies were presented from Kyoto Univ., KDDI labs., and NTT. Finally, a study on sensor networks considering heterogeneous networks were presented from Shizuoka Institute of Science and Tech. Many papers related issues of TCSR were presented in this special session and we could discuss in a broad context. We will continue this kind of special session in the future joint Workshop on Mobile Communications.

Fig. 7: Workshop on Mobile Communications.

7. Special Section of IEICE Transactions on Communications in December 2009

The Special Section on dynamic spectrum access has

been published on December 2009 issue of IEICE Transactions on Communications. 48 papers and 5 letters have been submitted. After fair and square review, 1 invited paper related to cognitive radio with fuzzy logic, 15 papers and 2 letters were accepted for publication.

These papers cover topical subjects such as spectrum allocation, spectrum sensing, MIMO mesh network, protocols, wideband RF systems, and multimode receivers.

8. Conclusion

Technical committee on software radio (TCSR) held five conferences in 2009 which corresponds to 10th anniversary. TCSR makes a strong effort to international collaboration with the research organization of software defined radio and cognitive radio fields all over the world. In this year, we had one joint workshop with international organizations, SDR. We have aggressive discussion in the joint workshop. TCSR is also interested in a technical exhibition of SDR equipments for exchanging the related information of hardware. We have one Technical Exhibition and the 10-year memorial event in July. In addition, we had a joint technical conference with TCAN and TCUSN and the topic in the joint conference is "wireless distributed networks." in October. In FY 2010 we will plan five conferences as follows:

-May 2010: Keio Univ. (Joint workshop with Wireless Innovation Forum (SDR Forum Version 2.0))

-July 2010: ATR. (Technical exhibition).

-Oct. 2010: Osaka Univ. (Joint Workshop on Wireless Distributed Networks cosponsored with TCs on AN, RCS, USN)

-Jan. 2011: Kyushu Institute of Technology (Joint workshop with E3)

-March 2011: Yokosuka Research Park (Workshop on Mobile Communications cosponsored with TCs on AN, MoMuC, RCS).

TCSR welcomes contributions from newcomers. We are looking forward to meeting you at conferences.

Report on 8th Asia-Pacific Symposium on Information and Telecommunication Technologies (APSITT 2010)

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Hikaru Suzuki**, Kiyoshi Ueda***, and Takeshi Kawasaki***
*Organizing Committee of the conference, NTT
**Organizing Committee Co-Chair of the conference, NTT Communications
***Secretary of the conference, NTT

1.Introduction

The Technical Committee on Information Networks and the Technical Committee on Network Systems successfully organized the 8th Asia-Pacific Symposium on Information and Telecommunication Technologies (APSITT), held at Damai Beach Resort, one hour drive north from Kuching, the capital of Sarawak, Malaysia, on Jun. 15-18, 2010, sponsored by the IEICE Communications Society.

2.Concept and Brief History of APSITT

APSITT was established with the aim of raising the prosperity of the Asia-Pacific region by presenting opportunities for academic forums for mutual understanding and friendship among researchers and leaders in the information and telecommunication fields. The 8th APSITT followed the seven conferences shown below.

1st: Nov. 1993, Bangkok, Thailand
2nd: Mar. 1997, Hanoi, Viet Nam
3rd: Aug. 1999, Ulaanbaatar, Mongolia
4th: Nov. 2001, Atami, Japan/Kathmandu, Nepal (held by video conference)
5th: Nov. 2003, Noumea, New Caledonia
6th: Nov. 2005, Myanmar Info-Tech, Myanmar
7th: Apr. 2008, Bandos Island, Maldives

3.Overview

In total, 100 papers were accepted among 116 submitted papers from Asian countries as well as some European countries. The key facts and statistics on APSITT 2010 are as follows.
- Sponsor:
    IEICE Communications Society
- Technical Co-Sponsor:
    IEEE Communications Society
- Organizers:
    Technical Committee on Information Networks
    Technical Committee on Network Systems
- Conference Dates:
    Jun. 15-18, 2010
- Conference Venue:
    Damai Beach Resort, Sarawak, Malaysia
- Participants:
    Total 112 people (30 students)

4.Opening Session

The first half of the Opening Session, Opening Ceremony started in Malaysian ceremonious atmosphere with two welcoming speeches from Japan and Malaysia side, and one Opening Speech by Malaysian Assistant Minister. The first speech was the Welcome and Opening Remarks by Mr. George Kimura, Organizing Committee Co-Chair, NTT West Corporation. The second speech was the Welcoming Speech by Prof. Dr. Peter Songan, Deputy Vice Chancellor, UNIMAS. The third speech was the Opening Speech by YB Datuk Haji Talib Zulpilip, Assistant Minister of Tourism, Ministry of Tourism and Heritage Sarawak. The Opening Ceremony finished with the Assistant Minister's Gong which showed opening of the conference. A scene of Opening Ceremony is shown in Fig. 1.

After the first half of the Opening Session, a press conference was held for local journalists with seven VIPs. Several local newspapers and one TV program reported the conference.

In the second half of the Opening Session, we had four speeches. The Technical Program Overview by Prof. Hiroyuki Morikawa, Technical Program Committee Co-Chair, the University of Tokyo, summarized the technical session programs and the statistics of the submitted and accepted papers.

The first Keynote Speech was given by Mr. Aisharuddin Nuruddin, Director, Malaysia Communications and Multimedia Commission. He showed the history of administrative activities and latest challenges on Malaysian telecommunication and broadcasting.

The second Keynote Speech was given by Dr. Yuji Inoue, Chief Director, the Telecommunication Technology Committee. He gave the deep insight of seriousness of large amount of carbon consumption by the peat fire in Indonesia, and also stressed the importance of ICT network and systems which enables a reliable estimation system for carbon balances and standardization of the mechanism.

The last speech was the Guest Speech by Prof. Tomonori Aoyama, Keio University, which overlooked the trend of ICT as generously researching paradigm shift of ICT(possess/use inversion), New Generation Network & Future Internet, and Cloud Computing & Cloud Networking.

Fig. 1 Opening Ceremony.

5.Technical Sessions

80 papers were presented in 26 sessions covering various areas on information and telecommunication. Below is the list of the technical sessions.

- Applications, Ubiquitous 3, Contents Delivery 2
- P2P, Home Network & Green ICT
- Security, Network Systems 2, IP-VPN/IPsec 2
- Traffic & QoS 4, Wireless 2, Adhoc 2
- Optical Networking 2
- Routing & Traffic Engineering 3

6. Cooperation with Local Entities

This conference was held with great support of Universiti Malaysia Sarawak (UNIMAS), which is the local University in this region. The Vice Chancellor Prof. Dr. Khairuddin Ab HAMID played a General Chair of this conference, and not only the Local Arrangement Committee members but other many staffs supported the planning and operation of this conference. Japanese and Malaysian staff members are shown in Fig. 2.

Prior to the conference, the General Chair and UNIMAS staffs welcomed the Japanese committee members near the Kuching International Airport. APSITT2010 Founder Dr. Inoue made him a present of a crystal plaque as expressing the appreciation of their warm welcome and faithful cooperation.

At the banquet in the evening of the opening day of the conference, each Malaysia and Japan side made a short speech. Dr. Wan Azlan, from Malaysia side, who played central role of the local arrangement, stressed the success of the opening day of the conference as overcoming many differences of culture and customs between both countries. Dr. Miyake, from Japan side, left an impression of Japan and Malaysia's long term good relationship by mentioning the Japan-Malaysia collaboration of the Multimedia Super Corridor project which he took part in himself.

After the speeches from both sides, Mementos were exchanged between Deputy Vice Chancellor Prof Dr. Peter Songan, Dean Prof. Dr. Wan Hashim from Malaysia side, and Dr. Inoue, Dr. Miyake from Japan side. During the banquet, UNIMAS BAYU group entertained all the participants with their beautiful prize winning Malaysian cultural dances. The scene of exchanging Mementos at the banquet is shown in Fig. 3.

After the three days of technical sessions successfully finished, UNIMAS invited us to their university as the conference technical visit. The participants looked over the university's facilities, received explanation of their ongoing studies.

We feel the good relationship established through this conference is very precious, and hope it continue to progress after this start at APSITT 2010.

Fig. 2 Japanese and Malaysian staff members.

Fig. 3 Exchanging Mementos at the banquet.

7.Information

Further information on APSITT2010 is available at the following URLs.

APSITT 2010:
http://www.ieice.org/cs/in/APSITT/2010/

Technical Committee on Information Networks:
http://www.ieice.org/cs/in/jpn/

Technical Committee on Network Systems:
http://www.ieice.org/cs/ns/jpn/

Call for Participation to ICC 2011, Kyoto

Takashi SHIMIZU and Hiroyuki KASAI
ICC2011 Organizing Committee, IEICE-CS

1.Introduction

The International Conference on Communications 2011 (ICC 2011) will be held in Kyoto 5-9 June, 2011. The overall program will consist of keynote addresses, 12 technical symposia, tutorials, workshops and business forums. Additionally, industry-led exhibitions for telecommunication systems and services will be held. We encourage you to participate in this unique opportunity for expanding your research carrier in telecommunications.

2.ICC/Globecom: Flagship Conferences

ICC and Globecom are flagship conferences of the IEEE Communications Society (Comsoc). The history started when the first Globecom was organized by the predecessor of Comsoc in 1957. The seventh Globecom in 1965 was enlarged to attract broader community, and is called International Communications Convention, which is recognized as the first ICC. Its objective was to foster an annual communications conference, at which it was hoped that various IEEE groups having telecommunications interests would consolidate technical symposia and sessions. Since then, this conference was held annually, and we will have a 47th conference in Kyoto next year (fig.1).

3.Globecom 1987 Tokyo

The previous occasion we had in Japan was Globecom 1987 (fig. 2). It was held in Tokyo in Nov. 15-18, 1987, sponsored by IEEE Communications Society and IEICE, and the conference was organized by the following executive leaders.

- General Chair: Hiroshi Inose, (NACSIS: National Academic Center for Science Information Systems)
- Executive Chair: Minoru Akiyama, (University of Tokyo)
- Technical Program Chair: Noriyoshi Kuroyanagi, (Tokyo Engineering University, currently, Tokyo University of Technology)

It consisted of two key notes, 54 sessions of technical presentations, 5 special sessions, tutorials, and was concluded by twilight cruise and post-conference technical tours.

4.ICC in Kyoto

Kyoto City reigned as the capital of Japan for 1200 years, and is known as the culture heart of Japan. With the theme of ICC2011: Source of Innovation: Back to the Origin, the conference is expected to provide opportunities to rethink traditions and conventions, which will lead to epoch-making innovations.

The history of Kyoto City has left a legacy of tradition and elegance and made it a living museum. I hope you enjoy attending the technical and the social events at IEEE ICC 2011 but take time to experience hospitality for which Kyoto is renowned while exploring its old temples, shrines, and sublime gardens.

The venue, Kyoto International Conference Center (ICC Kyoto) is the first national conference facility in Japan, when it opened in 1966 (fig. 3). This venue is the most suitable one in Japan, considering the flagship conference like ICC.

5.Final Remarks

We sincerely hope to see you in ICC in Kyoto.

Fig. 2   Conference LOGO of Globecom 1987

	ICC	Globecom
	ICC	Globecom
1987	Seattle	Tokyo
2004	Paris/France	Dallas
2005	Seoul/Korea	St. Louis
2006	Istanbul/Turkey	San Francisco
2007	Glasgow/UK	Washington DC
2008	Beijing/China	New Orleans
2009	Dresden/Germany	Honolulu
2010	CapeTown/South Africa	Miami
2011	**Kyoto/Japan**	Houston

Fig. 1   Recent History of ICC/Globecom

Fig. 3   International Conference Center Kyoto

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

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

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From Editor's Desk

●IEICE Society Conference in Osaka

The IEICE Communications Society (CS) Conference will be held at Osaka Prefecture University in Sakai City on September 14 (TUE) to 17 (FRI). On the first day of the conference, we will have the third CS Welcome Party with some food and drink sponsored by the IEICE CS. It's free. In the party, young talented researchers from main companies will have nice short speeches in communications area, and you can exchange ideas and views in an informal manner under friendly atmosphere. We hope that many members of the Communications Society, especially student members and young members, will really have a very nice time in the party. Please attend the next conference in Osaka to enjoy the party!

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Original paper submissions dealing with the following topics are invited to be considered for presentation at the Conference:

1. Closing the Gap Between Theory, Development and Applications
a) Novel sensing modalities for distributed and point sensors
b) New fiber and coating materials for sensing
c) Micro- and Nano-structured fiber sensors
d) Sensor characterization and specifications
e) Sensor interrogation systems and techniques
f) Sensor multiplexing and large sensor arrays
g) Sensor reliability, field tests and standardization

2. Society Issues in the 21st Century
a) Geophysical sensors
b) Structural Health Monitoring
c) Aerospace, automotive and marine engineering
d) Environmental sensors for air and water
e) Biomedical sensors
f) Sensors for harsh environments
g) Intrusion, transportation and border security

Location:
Fairmont Château Laurier Hotel, Ottawa, Canada

A 4-page paper and a separate 100 word abstract must be submitted electronically via the OFS21 website, http://www.ofs21.org/, where full instructions can be found.

The deadline for submission is 21 October 2010.

All submissions will be reviewed by The OFS21 Technical Program Committee. Notification of acceptance will be by 31 January 2011. Accepted abstracts will be included in the Conference Programme and the papers will be published by SPIE.

Contributors to OFS21 are also invited to submit their expanded papers to a Special Issue of IEEE/OSA Journal of Lightwave Technology. Papers will be subject to the same high standards of the peer review as regular submissions to the Journal. The deadline for submissions to the Special Issue is 30 June 2011.

A Student Paper Contest will be held with cash awards for the best papers

We look forward to welcoming you to OFS again, and for the first time to Ottawa.
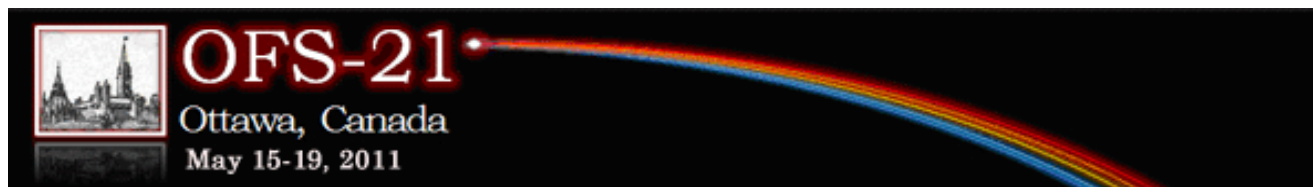
OFS-21
Ottawa, Canada
May 15-19, 2011

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The 6th International ICST Conference on Cognitive Radio Oriented Wireless Networks and Communications
June 1st – June 3rd 2011 in Yokohama, Japan

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◆ **Scope**

Radio spectrum is becoming exhausted because of the growing demands for wireless broadband communications. To cope this problem, the paradigm shift from the conventional exclusive use of frequency resources to the flexible frequency utilization is indispensable for future wireless networks. Cognitive radio is a key technology that brings us an emerging paradigm of flexible frequency spectrum usage. By cognition of the radio frequency environment, cognitive radio terminals dynamically select the optimal frequency and transmission media with cooperation of networks. In these regards, this conference provides opportunities for researchers in both academia and industry to present the latest technologies and exchange ideas in the area of cognitive radio. The following topics are welcome to this conference.

◆ **Topics**

Track 1 – Dynamic spectrum access / management
• Wideband, cooperative, and compressed spectrum sensing
• Multi-dimensional dynamic spectrum access / sharing
• Dynamic radio resource management / interference coordination
• Cooperative and coordinated multiuser communications
• Multi-antenna / multi-link transmission
• Flexible PHY / MAC control

Track 2 – Cognitive networks
• Heterogeneous networks
• Cooperative networking / transmission
• Self organized networks
• Load balancing and network optimization
• Cooperative radio resource management
• Cross-layer control for cognitive networking

Track 3 – Modeling, regulation and standardizations
• Cognitive channel / interference modeling
• Network information theory
• Dynamic spectrum access in TV white space
• Policy based cognitive radio control
• Protocol issues for cognitive radios

Track 4 – Architecture and Implementations
• Reconfigurable antennas and RF circuits
• Software defined radio and flexible radios
• Hardware prototypes for cognitive radio
• Certification and security issues

◆ **Important Dates**

Special Session Proposals Due: Sep. 1st, 2010
Paper Submission Due: Jan. 15th, 2011
Tutorial Proposals Due: Feb. 14th, 2011
Acceptance Notification: Mar. 15th, 2011
Camera-ready Submission Due: April 15th, 2011

Call for Papers

http://www.crowncom.org/2011/

Contact: info@crowncom.org

ICST.ORG

CREATE-NET

WIRELESS INNOVATION FORUM

IEICE Communications Society

------- **Special Section on New Generation Mobile and
Sensor Networking and Future Networks** -------

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on New Generation Mobile and Sensor Networking and Future Networks" in **June 2011.**

Lots of innovative researches for New Generation Network (NwGN) and the Future Internet (FI) are on ongoing for clean-slate redesign of the current architectures. On the contrary, innovative wireless technologies are emerging, e.g. beyond 4th generation mobile systems, sensor networks and virtual/augmented reality applications with real-space information, and cognitive radio technologies. Thus it is strongly expected that NwGN and FI are designed to be integrated with such technologies. Thus a special section is being planned (scheduled to appear in the June 2011 issue) to discuss new visions, ideas, and results of a further promote research and development of New Generation Mobile and Sensor Networking and Future Networks, in wider range of research communities. This special section solicits not only standard full papers and letters but also position papers describing mainly innovative ideas.

1. Scope
This special section aims at timely dissemination of research in these areas. Possible topics include, but are not limited to:
- New mobility architectures and new design principles of such architectures
- New communication paradigms for mobility and sensors (eg. DTN and Things in Internet)
- New network architectures for beyond 4th generation mobile communication and cognitive radio systems
- New fixed-mobile conversion technologies for New Generation Network (NwGN)
- Sensor/sensor network/virtual/augmented reality technologies for NwGN
- Autonomic networking frameworks and security architectures for new mobile networks
- Testbeds for above technologies and experimental results

The papers that focus on only layer 1, 2 technologies of wireless networks are out of scope.

2. Submission Instructions
The standard number of pages is 8 for a PAPER and 2 for a LETTER. The maximum number of pages for the initial submission of a LETTER is 4. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guideline in the "Information for Authors". The latest version is available at the web site, http://www.ieice.org/eng/shiori/mokuji_cs.html. The term for revising the manuscript after acknowledgement of conditional acceptance for this special section could be shorter than that for regular issues (60 days) because of the tight review schedule. This special section accepts submissions of not only standard full papers and letters but also position papers describing mainly innovative ideas. A position paper will be handled and published as a LETTER containing contents of (5), (6), or (7) defined in "1.3 Type of Manuscript" of "Information for Authors."

This special section will accept papers only by electronic submission. Prospective authors are requested to follow carefully the submission process described below.

1. Submit a manuscript using the IEICE Web site https://review.ieice.org/regist_e.aspx. Authors should choose the [Special-EB] New/Next Generation Mobile and Sensor Networking and Future Networks as a "Type of Issue (Section)/Category of Transactions" on the online screen. Do not choose [Regular-EB]. Write "position paper" in "Any further inquiries and comments to the IEICE Publishing office" when submitting a position paper.

2. Send "Copyright Transfer and Page Charge Agreement" and "Confirmation Sheet of Manuscript Registration" by E-mail, FAX or postal mail to the following address (guest editor of the special section) **by September 30, 2010**. There is a possibility that we shall withdraw the manuscript without receiving them **by September 30, 2010**, even if we have received the manuscript by electronic submission. For additional guidelines on manuscript preparation, please visit the web-page: http://www.ieice.org/eng/shiori/mokuji_cs.html

    Send the above documents to:
    Homare Murakami
    New Generation Wireless Research Center
    NICT (National Institute of Information Communications Technology)
    Address: 3-4 Hikarino-oka, Yokosuka, Kanagawa 239-0847, JAPAN
    Tel: +81-46-847-5067, Fax: +81-46-847-5110, Email: nwgn-paper-2@mail.ieice.org

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* Please note that if accepted, all authors, including authors of invited papers, are requested to pay for the page charges covering partial cost of publications. Authors will receive 50 copies of reprints.
* At least one of the authors must be an IEICE member when the manuscript is submitted for review. Invited papers are an exception. We recommend that authors unaffiliated with IEICE apply for membership. For membership applications, please visit the web-page, http://www.ieice.org/eng/member/OM-appli.html

------- Joint Special Section on Opto-electronics and Communications for Future Optical Network ------

The IEICE (Institute of Electronics, Information and Communication Engineers) *Transactions on Communications* and the IEICE *Transactions on Electronics* announce a forthcoming joint Special Section on Opto-electronics and Communications for Future Optical Network to be published in July 2011.

This Special Section will be published in conjunction with the 15th Optoelectronics and Communications Conference (OECC 2010), which will be held in Sapporo, Japan on July 5-9, 2010, cosponsored by IEICE Communications Society and IEICE Electronics Society.
The purpose of this Special Section is to present a collection of original papers that give an overview of current progress of research, development, and applications of optical communication systems and optoelectronics.

Submission of the paper presented at OECC 2010 is strongly encouraged. However, presentation of the paper at OECC 2010 is not mandatory for its inclusion in this Special Section. Presentation at the Conference does not ensure the acceptance of the paper. Note that the regular reviewing process will be performed for this Special Section.

1. Scope
The major topics of interest include:
- Core/access networks and switching subsystems (category 1),
- Transmission systems and their subsystems (category 2),
- Optical fibers, cables and fiber devices (category 3),
- Optical active devices and modules (category 4),
- Optical passive devices and modules (category 5).

Papers in category 1 and 2 should be submitted to The IEICE *Transactions on Communications*, and papers in category 3 to 5 to The IEICE *Transactions on Electronics*.

2. Submission Instructions
The standard number of pages is 8 (Letters are not accepted in this special section). The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guideline in the "Information for Authors". The latest version is available at the web site, http://www.ieice.org/eng/shiori/mokuji_cs.html. The term for revising the manuscript after acknowledgement of conditional acceptance for this special section could be shorter than that for regular issues (60 days) because of the tight review schedule.

This special section will accept only papers by electronic submission. Prospective authors are requested to follow carefully the submission process described below.
1. Submit a manuscript and electronic source files (TeX/Word files, figures, authors' photos and biography) for publishing using the IEICE Web site https://review.ieice.org/regist_e.aspx **by October 31, 2010**. Considering the technical field of the paper, authors should choose the [Special-EB] or [Special-EC] Joint Special Section on Opto-electronics and Communications for Future Optical Network as a "Type of Issue (Section)/Category of Transactions" on the online screen. Do not choose [Regular-EB] or [Regular-EC].
2. Send "Copyright Transfer and Page Charge Agreement" and "Confirmation Sheet of Manuscript Registration" by E-mail, FAX or postal mail to the following address (guest editor of the special section) by the above due date. There is a possibility that we shall withdraw the manuscript without receiving them by the due date, even if we have received the manuscript by electronic submission. For additional guidelines on manuscript preparation, please visit the web-page: http://www.ieice.org/eng/shiori/mokuji_cs.html

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Call for Papers

Special Section on Deployment and Operation of New Internet Technology: Challenges and Approaches
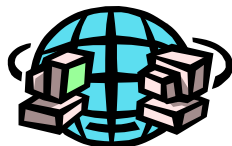
The IEICE Transactions on Communications announces a coming special section on "Deployment and Operation of New Internet Technology: Challenges and Approaches" to be published in August 2011.

The purpose of this special section is to exchange recent information and to promote research, development for deployment and operation of new Internet technologies and their advanced applications for sustainable growth of the Internet. Emphasized topics include testbed, field trial, and standardization of new Internet technologies. The special section solicits paper submission from all people engaged in this field.

1. Scope

・Testbed, Field trial, Standardization of new Internet technologies
・Protocol (IPv6, transport, transition), Routing, Addressing, DNS, DHT, Overlay, P2P
・Mobile, Wireless Internet
・Internet security, Internet operation/management/measurement
・Internet traffic/QoS
・Virtualization, Distributed network, Scale out technology, High-reliability, Fault-tolerance
・Internet application（Streaming, Social-media, Social-network）

2. Submission Instructions

The standard number of pages is 8 for a PAPER and 2 for a LETTER. The maximum number of pages for the initial submission of a LETTER is 4. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guideline in the "Information for Authors". The latest version is available at the web site, http://www.ieice.org/eng/shiori/mokuji_cs.html. The term for revising the manuscript after acknowledgement of conditional acceptance for this special section could be shorter than that for regular issues (60 days) because of the tight review schedule.

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