

***IEICE Communications Society* GLOBAL NEWSLETTER Vol. 3**

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Towards the next generation of Communications Society technical committees

Yoshinori Sakai
President for the next term, Communications Society



The technical areas covered by the Communication Society include basic and application technologies that create a future information communication network, and a communication and information theory. Technology is progressing day by day. We have sixteen standing technical committees and three temporal ad hoc committees. The ad hoc technical committees are discussing new prospective technical fields and application technologies. Many presentations and discussions are held at technical committee meetings, ones concerning technologies for current and future communication. Recently, committees have held domestic and, sometimes, international conferences. Some standing technical committees have a long history. Committees concerning, antennas and propagation, space, aeronautical and navigational electronics, switching, and communication systems were founded about forty years ago. These committees have not only studied their technical fields but have also produced many new technical committees to discuss new ones, during their activities. As a result, our society currently covers wireless and mobile communication, network technology including both the traditional telephone network and the Internet, optical communication technology, energy engineering, and electromagnetic compatibility. Our society has been growing by producing new technical committees that cover new technologies.

Current key concepts in networks are the concept of broadband, mobile, and ubiquitous. Broadband networks need many technologies concerning optical communication. Mobile communications need technologies concerning antenna and wireless communication. Ubiquitous networks, however, are a new concept. They are considered to be the future for the Internet. Energy engineering and antenna technologies are key issues for their creation, as well as a P to P technology of the Internet. Thus, our committee covers hardware and software technologies, and also basic and application technologies to build a new information society.

However, difficulties arise with how to manage the many technical committees because progress in the network system is too rapid. Every year, new network technologies and concepts are born, for example, semantic web, ubiquitous, and SOAP. Some technologies are classified as application technologies.

They might disappear before they are applied to an actual network. Many researchers are interested in new technologies; as a result, many technical committees including standing ones lean towards the same fields. Some application technologies and new concepts have a tenuous status meaning that they might be obsolete in a few years. System technology is an example of application technologies. For example, low power consumption signal processing is not only the basic technologies of the ubiquitous network, but also the key for all other mobile systems. It can be applied to many kinds of systems. However, many application technologies and concept particular to the ubiquitous network depend on the progress of the ubiquitous system. Standing technical committees usually cover the general or basic technologies that are not likely to disappear for several years. These application technologies and concepts themselves are very important and are worth the time for standing committees, as well as ad hoc committees, to discuss. Competition between technical committees is of course useful for the progress of society. However, too much competition, especially concerning application technologies, is ineffective. There are three important issues. First, we must always be careful concerning the area each technical committees addresses, and second must check whether basic and future technologies to create the future network are included in some technical committee. We also must check whether many committees are interested in the same technical area or not.

STRATEGY AND THE OBJECTIVES FOR ICT SECTOR DEVELOPMENT IN MONGOLIA

Dr. Sukhbaatar Bilgee
Chairman,

Science and Technology Council of Communications, Mongolia



First of all I would like to congratulate the IEICE Communications Society for launching a new publication, the Global News Letter.

I would like to briefly present the projects and programmes implemented during the last few years for the purposes of fulfilling the objective of the Government of Mongolia to develop ICT sector, their importance and the current status of the ICT sector development in Mongolia.

The Government of Mongolia has recently decided to set up a new Department of Information and Communications in the Ministry of Infrastructure. It will start its activities from the 1 January 2003. This is one of reason that the Government of Mongolia is faced with a necessity to develop ICT sector as one of the priority areas for fulfilling major objectives of supporting regional and rural development, building reliable infrastructure network, i.e., developing energy, roads, transportation, communication, tourism and public services.

ICT is dramatically changing the socio-economic structure of the environment we live in and hence the global world highly values the role of ICT and attaches a major significance in its development.

Following the same path the Government of Mongolia has put development of ICT sector as its priority and has worked together with the regional and international organisations in this field at a certain level during the last few years.

Current Status of ICT Development

Mongolian integrated telecommunications network consists of over 2100 km of analogue and almost 900 km of digital microwave links connecting Ulaanbaatar city and the aimag centres, satellite communication network, over 30 thousand km of transmission lines connecting aimag centres, soums and villages and 332 automatic switching stations with a total capacity of over 130000 telephony units. Average telephony density is 4.5 per 100 people. At present Mongolia communicates with over 150 countries of the World through Intelsat and Intersputnik systems and microwave links.

According to estimations the Internet network of Mongolia is supported by 7 providers serving about 30000 active users including 10000 registered subscribers.

During the last few years UNDP, Open Society Institute, World Bank, ADB, USAID, Canadian CIDA, the Governments of Japan, India, Korea and other international financial institutions are extending active cooperation in the fields of ICT development, professional training of personnel, increasing IT awareness and knowledge and so on.

Currently there are cellular telephony networks of CDMA, AMPS and GSM technologies with a total number of 200 thousand subscribers, paging network with 10 thousand subscribers, data communication and cable TV networks, 24 stations for radio broadcasting and 376 stations for receiving and re-transmitting TV programmes, radio broadcasting network covering over 300 aimag centers, towns, soums and villages and local area networks of the organizations operating in Mongolia. With introduction of cellular telephony services 20 thousand subscribers with no connection to a basic network are provided with an alternative choice of getting an access to information communication services.

The Government of Mongolia places a great attention to ICT sector development and has been taking concrete measures within the framework of specific goals in cooperation with international organisations. As a result of these efforts during the last few years 91.3% of entire interurban (cities-aimags) network was automated, transmission and switching facilities were upgraded by modern digital technologies and a capacity of a fixed telephony users increased by 15%.

By the assistance of the Japanese Government, it is preparing "Master Plan Study on Development of Rural Communication of Mongolia", which has got a significant importance in terms of introducing new technologies in rural communication network of Mongolia, determining trends of rural communication development, improving access to internet and new types of information communication services in rural

areas, carrying out necessary feasibility study and preparing priority projects.

It has just completed “Master Plan for the Development of Postal Service in Mongolia” in which new technologies and services based on IT have been considered as priority problems in postal sector. The Postal Master Plan has been prepared by the national experts of Mongolia.

In accordance with the Communication Sector Development Master Plan of Mongolia several package projects have been implemented with cooperation of the donor countries, international organizations. As a result the switching facilities of Ulaanbaatar and all the aimag centers were transferred to a digital technology and cable extensions and improvements were made, 9 aimag centers were connected with the capital city through VSAT system and fibre optic cable was installed along the railway line from the northern to the southern state border. These projects are considered to be the first steps towards creating potentials for introducing new types of services and transmitting international data and communication in future.

ICT Development Trends and Directions

World ICT market is rapidly growing and ICT sector is taking a lead role the national economies. IT has deeply penetrated the social life and has become a daily necessity.

Countries in the World are transferring to the next stage of socio-economic development – “Information Society”. According to the studies, as of the end of 2000 15% of GDP in the EU countries is contributed by IT sector and one out of four jobs created is generated by development of this sector.

Role and importance of ICT sector in the economic development of Mongolia are growing rapidly. Therefore, a need for implementation of number of important tasks and measures specified in the medium term strategic plan prepared in compliance with the ICT Development Concepts up to 2010 of Mongolia is becoming a top priority.

Medium Term Goals and Targetted Development Level for ICT Infrastructure Development of Mongolia

At the current stage of transition from an industrial era to a human centered information era ICT services as popular and common by nature services and technical and technological advancements are enormous which inevitably requires developing countries to interconnect and coordinate their policies and concepts and programmes on fostering ICT development in their countries.

For the purposes of creating legal environment for ICT development necessary ammendments and changes should be made in the concerning legal documents.

Basic approach for information infrastructure development is to aim at nearing the current level of development of Mongolia to the level of other countries in a shortest possible time.

The issues of a broader use and improvement of their effectiveness of computer facilities in response to the market needs taking into consideration the specifics of Mongolian economy, geographical location and population habitance and the population intellectual resources are becoming crucial issues. At the same time it requires complex set of measures closely linked with policies on technological improvement of communications and information sector.

The following measures are identified to be taken for implementation of the medium term ICT development goals:

- creation of a favourable legal environment and approval of necessary amendments to the related laws
- expansion, modernisation of ICT infrastructure at local level and its transfer to a digital technology, building a high speed network
- encouraging foreign and domestic private investment in the ICT sector
- establishment of a centralised and specialised electronic information databases, their expansion, update and organisational improvement to be able to offer extensive possibilities to the users in compliance with their needs and requirements
- establishment of a network for information exchange aimed at activating all forms of business
- development of electronic information in Mongolian language, its content and establishment of a portal for development information
- establishment of a software market through development and application of common package programmes and softwares to be used in Mongolian language
- emphasis on development of export oriented ICT industry and services
- training and retraining of highly skilled personnel, engineers and technicians
- penetration to foreign markets through establishment of a ICT training centre and joint ventures in Mongolia within the framework of special assistances for ICT development.

The aim is to establish complex ICT network to cover entire Mongolia through interconnection of Internet based services with basic telecommunication network using modern progressive technologies.

Implementation of medium term strategy on ICT and infrastructure development will create one of the prerequisites for establishment of a knowledge based

society, introduction of new types of services and needs, ensuring rural development, improvement of access to education and social services, reduction of

unemployment and poverty level and ensuring balanced level of regional development.

Special Issue on Historical Review of Antenna Systems in Japan

Kunio Sawaya* and Takayasu Shiokawa**

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Introduction

For the sake of advances in radio wave related fields such as communications, broadcasting, radar and so on, many types of antenna systems have been invented and/or developed so far in Japan.

The Technical Group of Antenna and Propagation (TGAP) established the “Historical Committee for Antennas” in May 2000, in order to neatly preserve information regarding as many antennas and related techniques invented and/or developed in Japan as possible, both those which have been already well used, in addition to ones expected to be used in the future. Also, the additional purpose of this committee is to encourage young researchers by introducing this valuable information.

The TGAP also decided to publish a special issue on “Special Issue on Historical Review of Antenna Systems in Japan”, which will appear in the IEICE Transactions on Communication in March 2003, in order to summarize Japanese antenna activities and introduce this information abroad, especially in the direction of Asia.

Contents

Many of the antenna systems invented and/or developed in Japan are so invaluable from technical viewpoints - for example, the Yagi-Uda Antenna and the Weather Radar Antenna located at the top of Mt. Fuji - that they were appointed for IEEE Milestones.

The Yagi-Uda antenna was invented by Professor H. Yagi and S. Uda, and is sensitive and highly-directive in the specific direction by using closely coupled parasitic elements. Fig. 1 is a photograph of a replica of the UHF transceiver developed by Uda in 1930 using the Yagi-Uda antenna.

The Weather Radar Antenna was located on the top of Mt. Fuji and could observe typhoons coming from



Fig. 1 Photograph of the replica of the UHF transceiver using the Yagi-Uda antenna.

the south to the main islands of Japan and contributed to the prevention of weather disasters in our country. Fig. 2 is a photograph of the Weather Radar Antenna.

We classify many antennas to 11 types of antenna and ask 21 authorities to summarize each antenna field as an invited paper. The authors and titles of 11 papers are as follows,

1. K. Sawaya, “Review of Research and Development on Linear Antennas”
2. T. Hori, “Antennas for Terrestrial Microwave Relay Link”
3. Y. Suzuki and J. Hirokawa, “Development of Planar Antennas”
4. S. Nomoto, “Reflector Antennas for Stations and Radio Telescopes”
5. S. Makino and N. Miyahara, “Satellite Onboard Reflector Antennas”
6. Y. Konishi, “Phased Array antenna”
7. N. Kikuma and M. Fujimoto, “Adaptive Antennas”
8. H. Arai and K. Cho, “Cellular and PHS Base Station Antenna Systems”
9. K. Nishikawa, “Land Vehicle Antennas”
10. S. Skine, H. Shoki, and H. Morishita, “Antennas for Wireless Terminals”
11. T. Itsuki, K. Shogen, and T. Kurashima, K. Ami, and M. Arishiro, “Tokyo Tower”

As many antennas and related techniques have been invented and/or developed so far in Japan, we apologize that it is impossible to categorize all of them.

Acknowledgement

The Guest Editors-in-Chief would like to thank all of the authors and the members of this issue’s editorial committee, Hiroyuki Arai, Hiroki Shoki, Jiro Hirokawa, Toshikazu Hori, Nobuyoshi Kikuma, Yoshihiko Konishi, Shigeru Makino, Shinichi Nomoto, Yasuo Suzuki, Masaharu Takahashi and Hiroyoshi Yamada.



Fig. 2 Photograph of the Weather Radar Antenna.

Technical Committee on Communication Systems



Iwao Sasase*, Keio University, Yoichi Maeda**, NTT,
 Ryutaro Kawamura***, NTT, Hiroshi Tomonaga***, Fujitsu Labs.
 Chikara Ohta****, Kobe University

*Chair, **Vice Chair, ***Secretary, **** Committee member

Introduction

The Technical Committee on Communication Systems (CS) was founded in 1960. The CS committee covers various and broad research fields associated with communication engineering and communication equipment, data networks and link engineering, communication theory and signal processing, and various applications. In this regard, CS meetings and workshops provide technical support, thus enabling researchers to thoroughly discuss state-of-the-art communication systems from various aspects. In consequence, the CS committee served as the basis for the foundation of the Optical Communication Systems (OCS) and the Radio Communication Systems (RCS) committees in 1988.

In this article, we introduce the activities of CS committee.

Scope

The following is a list of research fields covered by the CS Committee:

- Communication engineering and Communication equipment
 - Access network, FTTH, BPON/EPON, Transmission systems, Optical router/ADM, Router/Switch, Video transmission, Home network, Ad-hoc network, Power line communications, etc.
- Data networks and Link engineering
 - Network operation, Photonic network control, xDSL, etc.
- Communication theory and Signal processing
 - Encoding, Multiplexing, Information security, Digital signal processing, etc.
- Applications
 - Network appliances, VoIP, Web-based TV, etc.

Main Activities

3.1. Technical meetings

Two-day technical meetings are held six or seven times every year. Seven technical meetings are scheduled during the period from April 2003 to March 2004, as shown in Table 1. Among them, please pay closer attention to the November meeting since it will be co-held with the CSWS, introduced in the next section.

3.2. Communication Systems Workshop

Since 1989, the Communication Systems Workshop (CSWS) on Information, Communication, and Signal Processing has been held every year to discuss currently hot topics regarding communication systems. For this purpose, notable speakers are invited according to selected themes to give valuable lectures and participate in panel discussions. Topics such as image processing, broadband communication, multimedia communication, seamless networks, best-effort communication have been focused in the workshop’s previous sessions.

The CSWS committee (CS committee and CSWS executive committee) also organizes a special lecture with the aim to broaden participant’s knowledge beyond communication systems. These special lectures have been highly evaluated by the participants.

The CSWS committee tries to create the environment for the participants to freely discuss various issues and enjoy their time after daytime meetings.

So far, the CSWS has been annually held in November (except the first CSWS). Please put this event into your calendar for every year.

Table 1: Schedule of CS technical meeting

Date	Place	Themes	Co-organizer
May 22-23	Kagoshima Univ.	Photonic networks et al.	OCS
June 19-20	Yamagata Univ.	Broadband wireless access et al.	RCS
July middle	Not decided	Optical networks et al.	
Sept. 18-19	Tohoku Univ.	Active networks et al.	IN, NS
Nov. late *	Not decided	Broadband access et al.	
Dec. middle	Nagoya Univ., et al.	Image coding et al.	AVM, IE, BCS
March middle	Hiroshima Univ.	Network processor et al.	CAS, DSP

IN: Information Networks, NS: Network Systems, AVM(IPSJ): Audio Visual and Multimedia information processing, IE: Image Engineering, BCS(ITE): Broadcasting and Communication Systems, CAS: Circuit and Systems, DSP: Digital Signal Processing
 * November meeting will be co-held with CSWS.

The 15th CSWS

The 15th CSWS was held at Kagaya Inn in Nanao-shi, Ishikawa, on the 28th and 29th of November, 2002. Prof. Hideo Hashimoto of Kanazawa University served as the executive committee chief.

The theme was “Verification of Broadband Services towards Ubiquitous Information Society and Its Future”. A keyword “ubiquitous” was added to the theme of the 14th CSWS, “Opening of Broadband IT Services”, from the perspective that broadband services will become widely used in our lives due to ubiquitous character of information technology.

The CSWS committee set up three technical sessions to outline the future direction of our information society from various aspects such as technology, services, business, and creation of society. These sessions focused on the following topics: “broadband services”, “public information systems and its further research”, and “realization of ubiquitous network”.

The CSWS committee invited five speakers to the session on “Broadband services”: Dr. Donald Stalter (Terawave Communications Inc.), Mr. Masayuki Ito (NTT), Prof. Koji Okamura (Kyushu Univ.), Mr. Yutaka Hirakawa (NTT), and Mr. Ken-ichi Fukamachi (IJJ). The trends of overseas optical access business, optical commerce basic protocol, IP multicast protocol, streaming video distribution protocol, and security services were covered in this session.

Three speakers were invited to session on “Public information system and its further research”: Mr. Takuya Yoshida (Ministry of Public Management, Home Affairs, Posts and Telecommunications), Mr. Masashi Yagou (NTT Data), and Prof. Shigeki Yokoi (Nagoya Univ.). As substantial factor towards information society, information systems for electronic government, electronic voting, and disaster protection were covered in lectures during this session.

Prof. Hiroyuki Morikawa (Univ. of Tokyo), Mr. Mitsuaki Kakemizu (Fujitsu Lab.), and Mr. Tatsuo Itabashi (Sony) gave lectures on “Realization of Ubiquitous Network”. Deployment processes, middle ware, and fundamental technology of ubiquitous network and service were discussed in this session.

The CSWS committee invited Mr. Atsushi Kimura (Ishikawa-prefecture, Public Works Department) to give a special lecture entitled “Repair and Restoration of Kanazawa Castle”. The audience was impressed by his propositions how to ascertain the historical evidence and how to conduct the recovery process complying with the present building standard laws.

The CSWS committee would like to express its gratitude to all speakers for their participation, especially Dr. Donald Stalter, who visited Japan just to join the 15th CSWS in spite of thanks-giving day. Fortunately, the CSWS committee had 55 participants (Photo 1). The CSWS committee believes that all participants could outline and assess the future direction

of our information society through lively discussions after each lecture (Photo 2).

According to the policy of the CSWS committee, Kagaya Inn was selected as a conference venue. Kagaya Inn is one of the most famous hotels to provide high Quality of Service (QoS) in Japanese-style accommodation. Participants could receive premium service at conference rates thanks to the kindness of Kagaya Inn staff. Through banquet and subsequent party, participants could foster close relations (Photo 3).

Home page

We announce on a web page our committee’s information on meetings schedule, member profiles, workshops (CSWS), etc. English page is also available. Please take a look at it, and add it to your bookmarks.

URL: <http://www.ieice.org/cs/cs/>

Photo 1: Participants to the 15th CSWS



Photo 2: Talk of Dr. Donald Stalter



Photo 3: Japanese-style fellowship banquet



Technical Committee on Optical Fiber Technology (OFT)

Ryozo Yamauchi*, Fujikura Ltd.
Toshihiko Sugie**, NTT
Hisao Maki**, Sumitomo Electric Industries, Ltd.
Kazuo Hogari**, NTT
Masakazu Shigehara**, Sumitomo Electric Industries, Ltd.
*Chair, **Secretaries



Ryozo Yamauchi, Chair

1. Introduction

Today, optical fibers carry a huge amount of information and act as the nerve trunks of modern society. Optical fibers have been deployed not only in transport networks but also in metropolitan and access areas, and recently fiber to the home (FTTH). The function of the fibers is not limited to transmission. Since the optical power is confined in a small fiber core area, many functional devices have already been reported.

The technical committee on Optical Fiber Technology (OFT) is concerned with a wide range of optical fiber related technologies including communications, measurements, devices, and materials. OFT also contributes to the progress being made on fiber technology and its spreading applications.

2. Scope of study

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

- (1) Sensing by optical fibers
 - Optical fiber sensing systems
 - Optical fiber gyroscopes
 - Near-field optical fiber probes
 - Distributed sensing/remote sensing
 - Optical fiber measurement
- (2) Information control by optical fibers
 - Optical remote control systems
 - Optical solitonics information control
 - Optical fiber logic circuits
 - Optical fiber switching
 - Optical fiber tether wires
- (3) Energy transmission by optical fibers
 - High power transmission/distribution of laser light
 - Optical power distribution
 - Illumination / displays

- Laser processing / surgery systems
- (4) Optical signal transmission by optical fibers
 - Transmission of sensing and information control signals
 - Image guides
 - Installation and deployment of optical fibers in various environments
 - (5) Test systems for optical fiber transmission lines, and optical measurement of physical properties
- (6) Optical fibers and fiber-based components
 - Glass optical fibers
 - Plastic optical fibers
 - Optical fiber cables and their materials
 - Optical fiber amplifiers, fiber lasers, and optical modulators
 - Optical fiber gratings
 - Optical fiber couplers/optical filters
 - Optical fiber connectors, optical switches/switching mechanisms/micromechanisms
 - Reliability

3. Activities

(1) Technical meetings

OFT holds one- or two-day technical meetings six times a year, two in the Tokyo area and four in other regions. More than one hundred technical papers are presented annually to more than 500 participants. Some of the technical meetings are co-organized with the technical committees of the Communications Society and Electronics Society both in IEICE, and other institutes, to offer communication opportunities to researchers working in the field of optical fiber related technology.

The next technical meeting will be held in Tokyo on March 7, 2003. If you are interested in the meeting, please visit our web site <http://www.ieice.org/cs/oft/jpn>, or contact us by e-

mail. The e-mail address is hogari@ansl.ntt.co.jp or m-shige@yklab.sei.co.jp.

OFT is now planning to hold a Special Session on Specialty Fibers in 2003. The details will be announced soon.



Fig.1 Technical meetings

such as low non-linearity dispersion managed fibers, and wide-band low-noise optical amplifiers.

In conclusion, we are hoping to see you at a technical meeting soon.

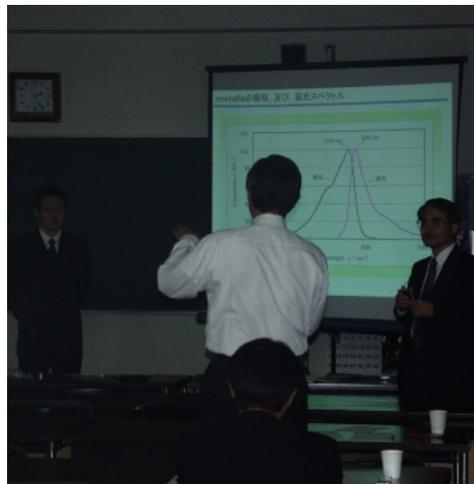


Fig. 2 Discussion at a technical meeting

(2) Recent topics in OFT

The following are examples of topics discussed in OFT.

1) Fiber to the home (FTTH)

The demand for broadband communication is currently driving FTTH in Japan. To construct an economical system, we must develop, for example, outside plant that can be easily installed, fiber management systems, and operation systems. OFT will hold a technical meeting on this subject.

2) Photonic crystal fiber

An optical fiber with longitudinal holes that are periodically or quasi-periodically aligned is called a photonic crystal fiber (PCF). Different structures may provide interesting characteristics that a conventional optical fiber cannot realize, such as very large optical non-linearity, or conversely very low non-linearity as found with a hollow waveguide, a large dispersion. Theoretical and experimental approaches have been reported at OFT technical meetings.

3) Management of dispersion and non-linearity of optical fibers

In the business sector, dense wavelength division multiplexing (DWDM) technology is still out of favor. In the research sector, however, people are looking at the next generation technologies,

Radio Communication Systems (RCS) Technical Committee

Committee Chair; Fumiya Adachi
Tohoku University



Introduction

Over the last 10 years, there has been a tremendous growth in the radio communications markets, e.g., cellular systems, wireless LANs, etc. Major services provided by radio communications systems are shifting from voice conversations to data communications. Along with this shift, convergence of radio communications, computing and Internet is on the way. This will be the driving force towards a wireless multimedia society. The aim of our technical committee of Radio Communication Systems (RCS) is to study and discuss the advanced radio communication technologies and system development.

Research Areas

Research area of RCS technical committee is roughly divided into 2 sub-areas: mobile communications systems and fixed radio access systems. Mobile communications systems and fixed radio access systems are quite different in their systems architectures, but both are evolving by taking different approaches to realize the wireless multimedia society.

(1) Mobile communications systems

The services of 3rd generation (3G) mobile communication systems started in Japan in 2001. Wideband direct sequence code division multiple access (DS-SS) technology is adopted in 3G. The research interests have been shifted to the development of advanced radio technology. The high-speed downlink packet access (HSDPA) is under development for enhancing 3G systems in terms of packet data rate; the maximum data rate will be increased to 14.4Mbps from 2Mbps of the present 3G. Another hot topic in recent technical meetings of RCS is the development of 4th generation (4G) mobile communications systems. A different access scheme from 3G systems might be used in 4G systems that supports data rates of around 100Mbps~1Gbps. What is considered as a promising candidate is multi-carrier (MC)-CDMA.

RCS covers multi-access techniques, channel coding, modulation/demodulation techniques, mobile communication systems, mobile computing, personal communication, mobile communication networks, radio equipment, etc.

(2) Fixed radio access systems

Fixed radio access systems and wireless LANs have been gaining popularity along with the spread of Internet communication services over the nation. Currently, wireless LANs are used in offices and homes with the data rates in the range of 11Mbps to 54Mbps. Field trials using wireless LANs in hot spot outdoor

areas, e.g., railway stations, hotels, cafeterias, are under way in Japan. Since wireless LANs can provide nomadic users with very high-speed access to the Internet, they will play an important role in our future wireless multimedia society.

RCS covers modulation/demodulation, fixed radio access, wireless LANs, broadcasting, multicasting, wireless CATV, radio on fiber, etc.

Activities

(1) Technical meetings

Technical meetings are held 9 times each year. Among 9 technical meetings, 6 meetings are planned to be jointly organized with other technical committees: Antennas and Propagation (AP), Communication Quality (CQ), Communication Systems (CS), Digital Signal Processing (DSP), Micro Wave (MW), Mobile Multimedia Communications (MoMuC), Network Systems (NS), Satellite Telecommunications (SAT) and Spread Spectrum Technology (SST). Each year, a night session is organized following regular technical sessions to discuss a hot topic issue in a relaxed mood with some drinks and foods. The last year night session entitled "Overview of HSDPA Standardization Activities in IMT-2000" was held at the RCS meeting in November. Figure 1 is a photo showing this night session. Figure 2 shows some slides presented in this session.

Last year, a total of 375 papers were presented. One of the hot topics was on 4G technologies. Also gaining interests in RCS meetings is multi-input multi-output (MIMO) antenna systems, which can significantly increase the data rate in a limited bandwidth. The schedules and programs of coming RCS technical meetings can be found in the RCS home page: <http://www.ieice.org/cs/rcs/jpn/>. An English session will be organized in the coming technical meeting at Yokosuka Research Park (YRP) in March 2003.

(2) Special sessions at general and society conferences

Special sessions are organized at general and society conferences. An English session "Multiple Access and Signal Transmission Techniques for Next Generation Mobile Communications" was organized at the last society conference at Miyazaki University. 16 papers were presented. Half of them are for OFDM and MC-CDMA. Some other papers are with advanced coding techniques including turbo coding and space-time coding.

(3) RCS Active Research Award

Since 2000, RCS Active Research Award has been given to young excellent researchers and engineers who are excellent speakers at RCS technical meetings. Last

year, the award was given to 7 speakers. Four out of seven awardees presented their papers related to OFDM and MC-CDMA techniques. Figure 3 shows a photo taken at the award giving ceremony.



Figure 1 Night session of Nov. 2002.

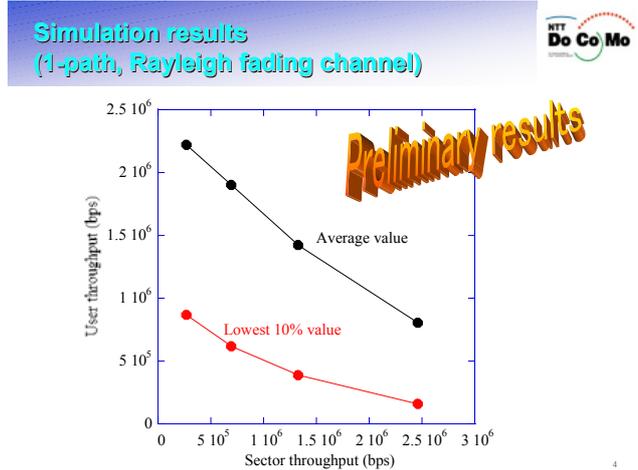


Figure 2 Some slides presented in the night session.

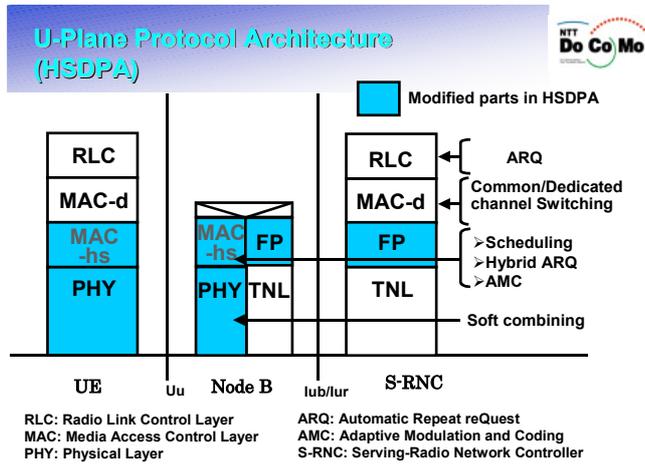
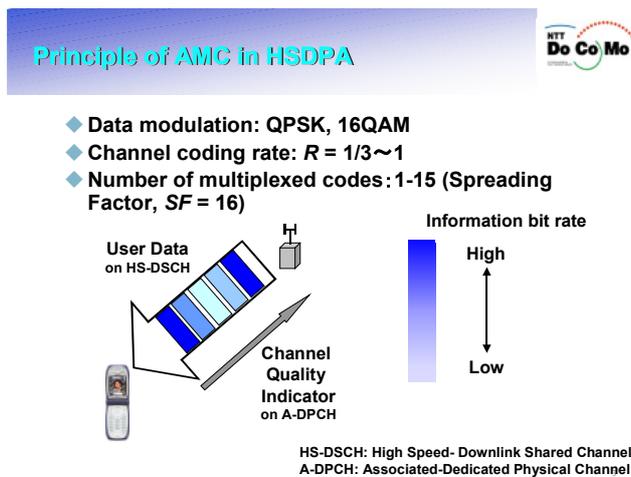


Figure 3 2001 RCS Active Research Award giving ceremony.



IEEE ComSoc sister society summit



Tadanobu Okada
Society vice chair, international relations

Introduction

IEEE ComSoc sister society summit was held just before the GLOBECOM 2002. I attended the summit to make a presentation on recent activities of the IEICE Communications Society (IEICE-CS) with regard to international relations. In this article, some highlights of our activities presented at the summit are reported as well as the meeting outline and discussions took place there.

Outlines and some results of the summit

- 1) Date and place: November 17, 2002, in Taipei
- 2) Participating members: Fourteen members attended the summit from Japan(IEICE), Taiwan, Vietnam, Canada, Croatia, Slovenia and IEEE ComSoc. KICS from Korea was absent.
- 3) Each society presented their activities including international relations, followed by questions and answers. Presentation by IEICE is shown below.
- 4) Croatia and Slovenia are to become sister societies of IEEE ComSoc, hence will join the summit from the Taiwan summit on.
- 5) So far sister society summits have been held in Asia and Europe in parallel. A proposal was made by IEEE ComSoc that these two regional summits would merge into a global one. All participating members agreed the proposal.

International relations activities by IEICE-CS

Increase of paper submission from outside Japan

R&D has become remarkably intensive in Asia. As a result the numbers of papers submitted to IEICE-CS Transactions from abroad has increased significantly in these years (see graph above). Major three areas are Korea, Taiwan and China. Papers from Japan shared 33% in 1999 while down to 26% in 2002. We welcome this situation very much, and the editorial board will make various efforts so that more researchers submit papers from outside Japan.

3.2 Dual membership

IEICE-CS has been promoting dual membership with IEEE-ComSoc and KICS. Based on sister society agreements, members of IEICE-CS are able to gain the same member services of IEEE-ComSoc or KICS in the case of paper submission and participation to a conference.

Number of the dual membership members is increasing constantly as indicated in the graph below.

3.3 Overseas membership campaign

New overseas membership campaigns took place many times

by setting booths in international conferences sponsored or co-sponsored by IEICE-CS, such as APCC 2001 (Tokyo, 24 persons), Globecom 2001 (Texas, 71), ICC 2002 (N.Y., 120), HPSR 2002 (Kobe, 32), OECC 2002 (Yokohama, 26), VTC 2002 Fall (Canada, 40) and Globecom 2002 (Taipei, 254).

Owing to those campaigns overseas members amounts to around one thousand, roughly 7% of the IEICE-CS members.

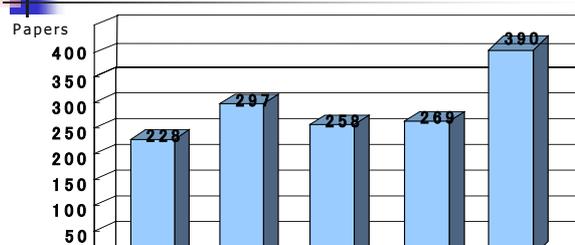
Magazine donation

In pursuit of more comprehension on IEICE's activities, IEICE decided to donate a full set of magazine from January to December issue in 2002 to selected 36 foreign research organizations which responded affirmatively to IEICE's query. They were located in Korea(17), Taiwan(10), China(2), Hong Kong(2), Australia(1), Singapore(1), Mongolia(1), Nepal(1) and Scotland(1).

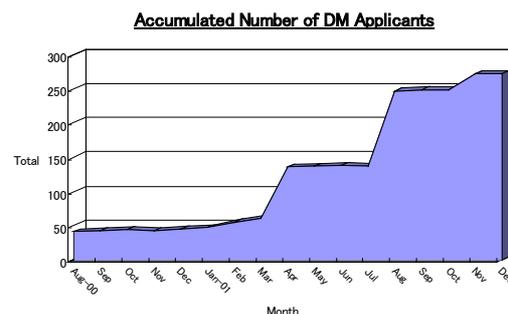
Concluding remarks

At the summit meeting participants were strongly impressed by the "globalization" of IEICE Communications Society, presented by activities 3.1 to 3.4 among others, of which I was very proud. I hope for stronger relationships with foreign societies be established.

IEICE English Trans on CS



ComSoc/IEICE-CS Dual Membership



IEEE Asia Pacific “Young Researcher Award”

Naoaki Yamanaka
NTT Network Innovation Laboratories

Introduction

Our IEICE sister society, IEEE ComSoc Asia Pacific board selected the recipients of the 1st IEEE ComSoc APB Young Researcher Awards at Globecom 2002, Taipei, Taiwan. Award Luncheon ceremony was held on Nov. 18 Monday with more than 600 attendees. APB director, K.C.Chen (IEICE dual member) awarded certificates and money to all recipients. They also are invited to the APB meeting and dinner at Grand Hyatt Hotel.

Young researchers, who are under 35 years old and active in the APB region as well as the communication field, were assessed in terms of their activity, originality and quality. The IEEE ComSoc APB has selected Dr. Byoung-Hoon Kim as Best Young Researcher and Prof. Wen-Jyi Hwang, Dr. Eiji Oki, Prof. Tomoaki Otsuki, Prof. Shiann-Tsong Sheu as Outstanding Young Researcher.



● Best Young Researcher



Byoung-Hoon Kim, GCT Semiconductor, Inc., Korea

for his contribution to CDMA, synchronization, channel coding, and signal processing for communications. Byoung-Hoon Kim received the Ph.D. degree in electrical engineering and computer science from Seoul National University, Seoul, Korea, in 2000. Since August 2000, he has been with GCT Semiconductor, Inc. developing W-CDMA and Wireless-LAN chip sets. His current research interests include CDMA, channel coding, communications theory, and signal processing for telecommunications. He is a co-author of *Scrambling Techniques for CDMA Communications* (Kluwer, 2001) and has published scores of papers on CDMA and communications systems. Dr. Kim received the Best Paper Award (on Communications) of Samsung Humantech Paper Contest in 1999, an Excellent Paper Award from Asia Pacific Conference on Communications in 1999, and the Best Paper Award from European Wireless 2000.



● Outstanding young researcher



Wen-Jyi Hwang, Chung Yuan Christian University, Taiwan

for his contribution to Layered Image Transmission and Video/Image coding.

Wen-Jyi Hwang received his diploma in Electronics Engineering from National Taipei Institute of Technology, Taiwan, in 1987, and his M.S. and Ph.D. degrees from the University of Massachusetts, Amherst, in 1990 and 1993, respectively. In 1993, he

joined the faculty at Chung Yuan Christian University, where he is currently a Full Professor of the Department of Electrical Engineering. He is the recipient of the Outstanding Research Professor Award from Chung Yuan Christian University in 2001. His research interests include multimedia communication, image/video coding, and digital signal processing.

is a member of the IEICE and the IEEE.



Shiann-Tsong Sheu, TamKang University, Taiwan

for his contribution to Protocol and architecture designs for wireless, optical and ATM networks.

Shiann-Tsong Sheu was born in Taiwan, R.O.C., in 1968. He received the B.S. degree in applied mathematics from National Chung Hsing University, Taiwan, R.O.C., and the Ph.D. degree in computer science from National Tsing Hua University, Taiwan, R.O.C., in 1990 and 1995, respectively. He is currently a professor in the Department of Electrical Engineering at Tamkang University. His research interests are in the area of wireless/mobile computing and multimedia applications.



Eiji Oki, NTT Network Innovation Labs., Japan for his contribution to Broadband network, ATM and Optical IP technology.

Eiji Oki received B.E. and M.E. degrees in instrumentation engineering and a Ph.D. degree in electrical engineering from Keio University, Yokohama, Japan, in 1991, 1993, and 1999, respectively. In 1993, he joined Nippon Telegraph and Telephone Corporation's (NTT's)

Communication Switching Laboratories, Tokyo Japan. He has been researching multimedia-communication network architectures based on ATM techniques, traffic-control methods, and high-speed switching systems in NTT Network Service Systems Laboratories. He is now engaged in researching and developing high-speed optical IP backbone networks as a Research Engineer with NTT Network Innovation Laboratories. Dr. Oki received the Switching System Research Award and the Excellent Paper Award from the IEICE in 1998 and 1999, respectively. He co-authored a book, “Broadband Packet Switching Technologies,” published by John Wiley & Sons, New York, in 2001. He



Tomoaki Otsuki, Tokyo University of Science, Japan

for his contribution to Optical CDM/CDMA Systems and Wireless Communication Systems.

Tomoaki Otsuki received the B.E., M.E., and Ph. D. degrees in Electrical Engineering from Keio University, Yokohama, Japan in 1990, 1992, and 1994, respectively. From 1993 to 1995 he was a Special Researcher of Fellowships of the Japan Society for the Promotion of Science for Japanese Junior Scientists. From 1995 to 1999 he was an Assistant Professor of Tokyo University of Science. From 2000 he has been a lecturer (tenured) of Tokyo University of Science. From 1998 to 1999 he was with the department of electrical engineering and computer sciences, University of California, Berkeley. He is engaged in research on optical communication systems, wireless communication systems, and information theory. Dr. Otsuki is a recipient of the 1997 Inoue Research Award for Young Scientist, the 1997 Hiroshi Ando Memorial Young Engineering Award, and Ericsson Young Scientist Award 2000, 2002 Funai Information and Science Award for Young Scientist. He is a senior member of the IEEE and a member of the IEICE Japan and the Society of Information Theory and Its Applications (SITA).

Report on ISAP i-02

Masaharu Takahashi*, Hiroyoshi Yamada**
 *Tokyo Univ. of Agr. & Tech., **Niigata University

Introduction

The 2002 Interim International Symposium on Antennas and Propagation (ISAP i-02), the eighth ISAP, was held at Yokosuka Research Park (YRP: Fig.1) in Yokosuka under the sponsorship of the Institute of Electronics, Information and Communication Engineers (IEICE), the co-sponsorship of the Korea Electromagnetic Engineering Society (KEES), in cooperation with the International Union of Radio Science (URSI), the Antennas and Propagation Society of the Institute of Electrical and Electronics Engineers (IEEE/AP-S) and the Antennas and Propagation Professional Network of the Institution of Electrical Engineers (IEE), and supported by YRP R&D Committee.

ISAP i-02 is intended to provide an international forum for the exchange of information on the progress of research on antennas, propagation, electromagnetic wave theory, and related fields.



Fig. 1 Symposium Site: YRP-1 Bldg. and Logo of ISAP I-02



Fig.2 Opening Ceremony
 K.Kagoshima, Chair of ISAP i-02,
 D.C.Park, President of KEES
 P.L.E.Uslenghi, President of IEEE AP-S

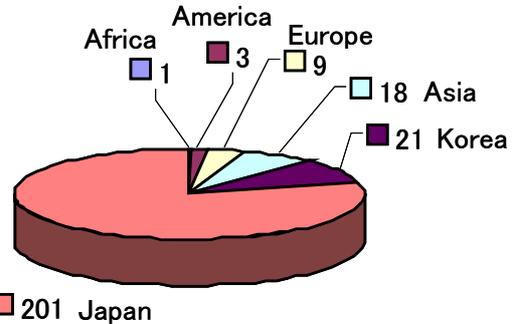


Fig. 3 Country Distribution of Participants

Statistics

- Number of participants: total 253
 - Number of Papers: total 138 papers including 3 invited papers and 30 poster session papers.
 - Number of participants: total 253, 18 countries
- Country distribution of the participants is shown in Fig.3. Oversea participants were about 21%.

Sessions and Contents

There were 18 oral sessions mainly focusing on Adaptive and smart antennas, broadband and millimeter wave antennas, computational electromagnetics, and Biological Effects and Medical Applications. One of them was organized by Prof. D. C. Park to report on "Recent Advantages of Antennas and Propagation in Korea" (Fig.4), and two of them are special oral sessions named "Last Minute Session" covering hot topics in AP field. In addition, there were three invited talks.



Fig. 4 Prof.D.C.Park at Session "Recent Advantages of Antennas and Propagation in Korea"

Invited Talks

Three invited talks that cover hot topics in wireless communication, computational electromagnetics, and EM-bioeffect fields were provided. The titles and speakers are listed below:

- *Challenges for Broadband Wireless Technology,*



Fig. 5 Invited Talk by Prof.F.Adachi



Fig. 7 Last Minutes Session on *Hot issues on UWB, MIMO and Security for Wireless Broadband Technologies*

(Ultra Wideband) technologies including its current developing status in the industry.

There were Poster Sessions and surely, we had a delightful Banquet. The YRP is one of the famous research area in communication, therefore, technical tours were planned. We hope all participants enjoyed to see and touch the forefront research in Japan.



Fig.6 Invited Talks by Prof.K.K.Mei and Prof. N.Kuster.

Prof. F.Adachi, Tohoku Univ. (Fig.5)

- *Theory of Maxwellian Circuits and ITS Applications to Multi Wire Systems*, K.K.Mei, City Univ. of Hong Kong
- *Human Head Phantoms for Compliance and Communication Performance Testing of Mobile Telecommunications*, N.Kuster, Federal Institute of Technology, Swiss (Fig.6)

Last Minutes Session

To arrange the sessions covering very hot and important topics after the deadline, two last minute sessions were organized, and active researchers were invited as speakers and panelists.

- *Electromagnetic Phantoms and Their Applications*
This session was treated a wide range of topics regarding EM-phantom, extending from SAR problems, medical applications to communication performance evaluations. A number of visual and animated presentations to help understand physical pictures and insights of EM-bioeffect problems were also provided. This session has an application of a panelist immediately before, and it had an active discussion.
- *Hot issues on UWB, MIMO and Security for Wireless Broadband Technologies*

This special session offers several aspects and hot issues on antenna, propagation, and systems in Broadband wireless technologies. Six related topics will be presented by invited speakers from both academia and industries. The emphasis is on applying Software Defined Radio, including MIMO techniques, to the future high-speed wireless communication systems, with emphasis on the seamless services between multi-wireless standards. Also, special attention is given to UWB



Buffet Party



Technical Tour : NTT DoCoMo



Poster Sessions

Fig. 8 Snapshots of ISAP I-02.

In ISAP, we are continuing to provide hot topics. The next ISAP will be held in August 17-21, 2004 in Sendai, JAPAN (<http://www.ieice.org/cs/isap/2004>).

So, Why don't you plan to attend the next ISAP!

Report of JC-SAT 2002

Takeshi Mizuike

Chair of the Satellite Telecommunications Technical Group of IEICE



Since 1980's, the Satellite Telecommunications Technical Group has been continuing activities in the technical research areas of satellite communications, satellite broadcasting and related satellite technologies in the Communications Society of the IEICE. There are a number of technical presentations at General and Society conferences every year on the new satellite technologies. Research workshops are also held about six times a year for presentation of the latest research outputs and exchange of new technical information.

Satellite technologies have an inherent property to provide very wide coverage for worldwide, regional and nationwide services. When the Communications Society of the IEICE started encouraging international activities, the Satellite Telecommunications Technical Group considered that satellite technologies are one of the most suitable research areas for such international activities because of its inherent nature. In this understanding, the Satellite Telecommunications Technical Group has been holding Joint Conference on Satellite Communications (JC-SAT) with Korea which is one of the most active countries in the research and development of satellite technologies. This Conference is jointly held by the Satellite Telecommunications Technical Group of the IEICE and Korea Society of Space Technology (KOSST). The first JC-SAT was held in 2000 in Seoul, Korea and the second JC-SAT was held in Nara, Japan last year. This year, the third JC-SAT was successfully held in Daejeon, Korea in October under co-sponsorship of IEEE VTS Japan Chapter, AIAA Japan Forum, ETRI (Electrics and Telecommunications Research Institute, Korea), KARI (Korea Aerospace Research Institute), IITA (Institute of Information Technology Assessment, Korea) and KICS (Korean Institute of Communication and Sciences). This JC-SAT has been contributing to exchange of the most advanced technical information between Japan and Korea through presentation of over thirty technical papers which introduce the outcome of the most recent research and development activities. This conference provides a good opportunity for technical discussion not only during technical sessions but also at a reception. Furthermore, this JC-SAT can be recognized as one of the most successful cooperation by Japan and Korea in the area of advanced satellite technologies. At the conference site, activities of the IEICE Communications Society were introduced to participants, for example, by distributing copies of this IEICE Communications Society news letter.



The author in his opening address.

This year's conference, named JC-SAT2002, had about 60 attendees mainly from Japan and Korea. The opening addresses were given by Dr. Seong Jong Chung, President of KOSST and the author. Following the keynote speeches from Emeritus Prof. Soon D. Choi of KAIST (Korea Advanced Institute of Science and Technology) and Dr. Hideki Mizuno of NTT DoCoMo, the former Chair of Satellite Telecommunications Technical Group, 35 papers were presented in eight sessions. In the keynote speech, Prof. Choi announced that Korea is planning to launch 20 satellites of 1.5-ton class by 2015 and also enhance engineers and facilities, followed by Dr. Mizuno reviewing the satellite developments in Japan. Those papers covered a wide variety of research topics, such as status of the Japanese and Korean R&D activities for space technologies, new satellite systems, onboard digital processing technologies, and so on. With regard to new satellite systems, Next generation Leo System (NeLS) and WINDS (Wideband InterNetworking Engineering Test and Demonstration Satellite) were introduced from Japan, while design and development of KOMPSAT-2 which is a successor of the multi-purpose satellite KOMPSAT-1, and development of mobile multi-cast service using KOREASAT-3 were reported from Korea. These papers showed both Japanese and Korean status of current R&D for satellite communications. On top of that, at this conference, there were two participants from US who presented a new broadband satellite service for aircraft. The details of papers on these topics are reported in the Technical Report of IEICE.

Japan will host the next joint conference in 2003. Details have not been determined yet; they will be announced on the home page of the satellite telecommunication technical group of IEICE (<http://www.ieice.org/cs/sat/jp>). Inquiries by email are also welcome (sat@ieice.org).

The 16th symposium on Optical Communication Systems “Photonics Network Technologies supporting Ubiquitous Networking World”

Joji Maeda

Faculty of Science and Technology, Tokyo University of Science



Overview

The optical communication system (OCS) technical group annually holds a symposium that provides a place for discussions on concurrent topics. In 2002, the 16th symposium was held on December 12th (Thursday) and on 13th (Friday) at Yumoto Fujiya Hotel in Hakone, Kanagawa-Prefecture. Aggregate attendance exceeds 180.

Hakone is a district near the border between Kanagawa- and Shizuoka-Prefectures. It is located about a hundred kilometers south west of capital Tokyo. The name is also used for a group of spa-resorts scattered in that district.

A keyword of the 16th symposium was “Ubiquitous Networking.” Today, broadband access to the Internet becomes more and more popular, and data transmission facility of cellular phone systems has been rapidly improved. We are about to obtain convenient ways of communication at end users level, whenever, wherever, and with whomever. We tentatively call such future network systems as ubiquitous networks. How the world will change with ubiquitous networks? What role should photonic networks play



Fig.1, K. Hagimoto, chair of OCS technical group.

in the forth-coming world?

The scope of the 16th symposium covers perspectives of the world with ubiquitous networks, change of the paradigm of optical communication systems, and required novel technologies therein.

Plenary talk: “Reviewing ubiquitous networking world”

After the opening speech by Kazuo Hagimoto, the chair of the OCS technical group, Prof. Hideyuki Tokuda of Keio University gave the plenary talk. The talk began with the root of the word “ubiquitous,” followed by recent usage both in the world and in Japan, and ended with introduction of several related technical projects.

The concept of “ubiquitous computing” (“ubiquitous networking” seems to be Japan-made-English) was first proposed by Dr. M. Weiser in early 1990s. To explain



the concept, the presenter showed an advertisement of “home motors” in 1918. They were electrical motors that should be used with machines in houses such as sawing machines, fans, etc. At the beginning of 20th century, electrical motors were sold by themselves. Today, sawing machines and fans were not sold without motors. When computers become ubiquitous, we will not be conscious of the existence of them.

He then mentioned network-related concepts, platforms, software, and several projects for realization, as well as their major technical problems.

The author was personally impressed by the problem of the right of disconnectivity. If networks become ubiquitous, all the people can be connected to some networks without notice. This connection will violate human rights that refuse the connection. The problem is not only in technologies but also in philosophies.



Fig. 3, Scene from product exhibition during coffee break.

Workshop 1: “Inspecting image of novel world provided by ubiquitous networking”

In this workshop, they discussed the concept of “ubiquitous networking,” its impact on the future world, and several experimental approaches to realize the concept. More precisely, they discussed current trends in the Internet traffic and their future perspectives, required system and device technologies, and, most



Fig.4, Panel discussion in Workshop 1. Top, left: A. Inomata (Fujitsu), center: J. Shimada (CRL), right: H. Morikawa (the Univ. of Tokyo), bottom, left: M. Nohara (Toyota IT Center), center: H. Nishikawa (Matsushita), right: H. Hojo (Fujitsu).

importantly, required optical communication system technologies.

The chair of this workshop was Prof. Hiroyuki Morikawa of the University of Tokyo. Titles and presenters are listed below:

1. Ubiquitous networking world forecast from e-Japan concept, Jun'ichi Shimada (CRL).
2. ISP Technologies necessary for realization of ubiquitous networking world, Akihiro Inomata (Fujitsu).
3. Development of Hot-Spot Services, Hiroshi Hojo (NTT).



Fig. 6, Scene from reception banquet.

4. Intelligent home electronics and networks, Hiroshi Nishikawa (Matsushita Electric).

5. Towards realization of seamless network access from mobile cars, Mitsuo Nohara (Toyota IT Center).

Throughout the presentations and panel discussions, it was reported that peer-to-peer traffics of such as music or video contents have been rapidly growing. They also mentioned that existing legal barriers, e.g., those between broadcastings and communications would become major problems. Optical communication systems were required to provide a physical layer that would realize high-speed broadband access with fair prices.

Lamp session: “What lacks in current cooperation between industries, the government, and universities?”

After reception banquet of European style, lamp session was held in another banquet room of Japanese style, where Prof. Ken'ichi Kitayama of Osaka University was the chairperson.

With an aid of alcohol, they keenly discussed about ideal cooperation between different research agents with different backgrounds. Past examples of successes and failures were freely criticized. Most appreciated opinion was against the title of this session: we must talk about “What is necessary?” rather than “What lacks?”

Invited talks

On the second day of the symposium, it opened with a session including four invited talks on needs, state-of-the-art, novel devices, and frontier of optical communication systems.

A talk given by Prof. Satoru Matsuoka of Tokyo Institute of Technology was titled “GRID computing and expectation to terabit networks: towards IT infrastructure in 21st century.” He discussed on the meaning of the GRID, which is a global concept to utilize effectively total computer resources in the world. He



Fig.5, Four invited speakers. Top, left: S. Matsuoka (Tokyo Inst. of Technology), right: K. Fukuchi (NEC), bottom, left: S. Noda (Kyoto Univ.), right: K. Inoue (NTT/Stanford Univ.).

also revealed that realization of GRIDs in the next generation would require huge capacity transmission systems of multi-terabit class.

Mr. Kiyoshi Fukuchi of NEC titled his talk as “Recent technologies of terabit optical communication systems and their future.” The talk was a clear and compact review on current research status of optical fiber transmission systems. He also mentioned problems of current technologies, particularly the lack of field tests, and the implementation of transmission technologies to network systems.

Prof. Susumu Noda of Kyoto University talked on “Recent technologies of photon control using photonic crystals and their future.” Interesting experiments of two dimensional photonic crystals used as wavelength switches was reported. Audiences were deeply impressed in real devices produced by using nano-technologies.

Mr. Kyo Inoue of NTT had temporarily left the company, and was staying in Stanford University as a guest researcher. The talk titled “Quantum communication watched by an engineer of optical communication” was a tutorial of quantum cryptography, which he was studying in Stanford. The audiences who usually manage light as a classical electromagnetic wave seemed to remember lectures (and their good or bad memories) of quantum mechanics in their universities.

Workshop 2: Innovative business of Optical Communication Systems

The National IT Strategy that began in 2001 has accelerated the widespread of broadband access lines such as ADSL, CATV, and FTTH, and it gradually enables subscribers to enjoy broadband services with one of the least cost in the world.

In this workshop, they focused on contents that are (or will be) transferred through the broadband lines, and discussed fields of business that would bring about



Fig. 6, Panel discussion in Workshop 2. Top, left: S. Nojima (Fujitsu Lab.), right: Y. Yamabayashi (NEL), bottom, left: T. Fujii (NTT), right: Y. Yamamura (eXcite co.).

change in societies. The chair was Mr. Yoshiaki Yamabayashi of NEL.

Three presentations below preceded panel discussions:

1. Future of network infrastructure and trends of business, Satoru Nojima (Fujitsu Lab.).
2. Business strategy of ISP anticipating photonic networks, Yukihiro Yamamura (eXcite co.).
3. Future of ultra high speed transmission technologies for digital cinemas, Tetsuro Fujii (NTT)

It was reported that access to the Internet through broadband lines has been rapidly increasing. An interesting report was that people who experienced xDSL eager to move to FTTH services. This report is quite encouraging for fiber-optic communities since it means potential demands for optical access networks.

Digital cinemas should be ranked currently as the highest quality audio-visual content, and have stirred interests of several cinema companies in Hollywood. Smooth real time distribution of digital cinemas requires a high capacity and stable network, which would be realized by photonic network technologies.



Fig. 7, Setup of digital cinema.

Before this session, a digital cinema was played in the hall. The audiences are amazed at high quality of image.

Impressions

To tell the truth, the word “ubiquitous” was unfamiliar to the author. I have found many of the word in the literature without pleasant sound in my heart, partly because of the lack of my knowledge.

Throughout this symposium, I tried to imagine what the word really was to mean, and partly succeeded. Its history and the range of its current usages have been cleared by excellent presentations. Perhaps I should be satisfied.

Yet, a question how optical communication systems support the ubiquitous networking remained to be solved. Should it remain as a mere infrastructure that only provides a huge capacity physical layer? Or, should it be armed by smart networking functions that break the current layer hierarchy? The answers should be prepared in engineers themselves, and would be discussed in the forthcoming OCS symposium!

Acknowledgment

The author thanks Dr. S. Saito of ATR for providing a precise report on Workshop 1.



IEICE Overseas Membership Page

The Institute of Electronics, Information and Communication Engineers

Membership for Overseas Candidates: **You can join one of the IEICE Societies and subscribe to IEICE Transaction (in English) of the registered Society as IEICE Overseas Regular Member, Overseas Student member, or Overseas Affiliate Member without voting right at the Institute’s election. Still more, you can receive Journal and Japanese Transactions by paying an additional charge. OMDP (Overseas Membership development program) is provided for candidates from countries/areas in Asia, Africa, Central America, and South America. This program is designed so that IEICE can contribute to and support the progress of science and technology throughout the world. Scientists and engineers in these countries/areas are encouraged to apply to the program.**

◆Please be noticed that Overseas Membership applies only to candidates who reside outside of Japan and who have non-Japanese citizenship.

IEICE Societies and Publications:

Societies	Transactions	Topical areas covered
A. Engineering Sciences	EA:Trans. on Electronics	Engineering Acoustics, Noise and Vibration, Speech and Hearing, Ultrasonics, Digital Signal Processing, Analog Signal Processing, Systems and Control, Nonlinear Problems, Circuit Theory, VLSI Design Technology and CAD, Numerical Analysis and Optimization, Algorithms and Data Structures, Graphs and Networks, Reliability, Maintainability and Safety Analysis, Cryptography and Information Security, Information Theory, Coding Theory, Communication Theory and Signals, Spread Spectrum Technologies and Applications, Mobile Information Network and Personal Communications, Intelligent Transport System, Image, Vision, Computer Graphics, Language, Thought, Knowledge and Intelligence, Human Communications, Neural Networks and Bioengineering, Multimedia Environment Technology, Communication Environment and Ethics, Concurrent Systems, Measurement Technology, General Fundamentals and Boundaries
B. Communications	EB:Trans. on Commun.	Fundamental Theories, Communication Devices / Circuits, Transmission Systems and Transmission Equipment, Optical Fiber, Fiber-Optic Transmission, Wireless Communication Technology, Terrestrial Radio Communications, Satellite and Space Communications, Optical Wireless Communications, Switching, Wireless Communication Switching, Network, Network Management / Operation, Software Platform, Internet, Antenna and Propagation, Electromagnetic Compatibility (EMC), Sensing, Navigation, Guidance and Control Systems, Energy in Electronics Communications, Terminals, Multimedia Systems, Broadcast Systems, Integrated Systems, Media Compound Method
C. Electronics	EC:Trans. on electron.	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:Trans. on Inf. & Syst.	Theory/Models of Computation, Theory of Automata, Formal Language Theory, Algorithms, Computational Complexity Theory, Computer System Element, VLSI Systems, Computer Systems, Theory and Models of Software, Software Systems, Software Engineering, Databases, Network, Fault Tolerance, Applications of Information Security Techniques, Cooperation in Distributed Systems and Agents, Artificial Intelligence, Cognitive Science, Man-Machine Systems, Multimedia Processing, Educational Technology, Welfare Engineering, Pattern Recognition, Speech and Hearing, Image Processing, Image Pattern Recognition, Computer Graphics, Multimedia Pattern Processing, Natural Language Processing, Biocybernetics, Neurocomputing, Medical Engineering

Membership Charges (UNIT: YEN):

Membership grades	Entrance Charge	Annual Membership Fee	Additional Society Registration	Additional Transaction Subscription	Journal Subscription
Service coverage for overseas members	_____	Included one Society and its Transaction	Registration of one more Society and its Transaction	Subscription to an additional Transaction of registered Society	(Written in Japanese only)
Regular Member (overseas)	1,400	7,000	3,500(/1 Trans.)	3,000(/1 Trans.)	6,000
Regular Member (overseas) with OMDP*	1,000	5,000	3,000(/1 Trans.)	2,500(/1 Trans.)	5,000
Regular Member (in Japan)	2,600	13,000	3,500(/1 Trans.)	3,000(/1 Trans.)	-
Student Member (overseas)	0	2,000	2,000(/1 Trans.)	1,500(/1 Trans.)	6,000
Student Member (overseas) with OMDP*	0	1,000	1,500(/1 Trans.)	1,000(/1 Trans.)	5,000
Student Member (in Japan)	0	4,500	2,000(/1 Trans.)	1,500(/1 Trans.)	-
Affiliate Member* (overseas)	800	4,000	3,000(/1 Trans.)	2,500(/1 Trans.)	6,000
Affiliate Member* (overseas) with OMDP*	400	2,000	2,500(/1 Trans.)	2,000(/1 Trans.)	5,000
Associate Member* (in Japan)	1,800	9,000	3,000(/1 Trans.)	2,500(/1 Trans.)	-

***OMDP** is to support members from countries/areas of Asia, Africa, Central America, & South America.

***Affiliate Member** is a person who is not a specialist of fields which IEICE subject to and who have an interest to our fields. And when you want to join IEICE as an Affiliate Member, you need recommendation of the society which you want to belong to.

Notice

1. Annual Membership Fee includes one Society and one Transaction which you choose.

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

2. If you want to register other Societies and Transaction, 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”,

and **Additional Transaction subscription (optional)** as “EB”. Your membership fee amounts to 7,000+3,500 yen / 5,000+3,000 yen.

3. If you want to subscribe to more than one Transaction in the same society which you register, please check “Additional Transaction subscription”.

Example : If you want to subscribe to Transaction of EA and A, please check **Society Registration** as “A”, and **Additional Transaction subscription (optional)**

as “A”. Your membership fee amounts to 7,000+3,000 yen / 5,000+2,500 yen.

4. If you want to change membership from “Regular Member” to “Overseas Member”, you don’t need to pay an Entrance Charge.

Optional Rapid Mailing Service: Surface mail charge is included in the Annual Membership Fee. 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 following table.

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

Further information: Please contact **IEICE Membership Activities Section;**
IEICE Headquarters Office, Kikai-Shinko-Kaikan Bldg., 5-8, Shibakoen 3
chome, Minato-ku, Tokyo

105-0011 JAPAN

Fax +81 3 3433 6659

E-mail: member@ieice.org

URL:

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

IEICE Overseas Membership Application Form

The Institute of Electronics, Information and Communication Engineers

URL <http://www.ieice.org/eng/member/OM-appli.html> E-mail member@ieice.org

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

Personal Information

Male
 Female
Full name: _____ **Nationality:** _____
First name Middle name Last name
 Prof. Dr. Mr. Mrs. Ms. Miss **Place of birth:** _____ **Date of birth:** _____
Day Month Year

Mailing Address

Home Office

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

Academic Background

The highest academic degree: Ph.D. Masters Bachelors Others: _____

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

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

Application Information

I want to enter the IEICE from April October year: _____

Membership: I want to apply for the following membership (check one item!)

Regular Member (Overseas) Student Member (Overseas) Associate Member (Overseas)
 ◆ If you want to apply for OMDP, please check; OMDP (Overseas Membership Development Program)

Society registration (It includes one Transaction in English):

A: Engineering Sciences B: Communications C: Electronics D: Information & Systems

Additional Society registration (optional): A: Engineering Sciences B: Communications C: Electronics D: Information & Systems
 Additional Transaction subscription (optional): EA: Fundamentals EB: Communications EC: Electronics ED: Information & Systems
 A (Japanese) B (Japanese) C (Japanese) DI (Japanese) DII (Japanese)
 Journal subscription (optional) (Japanese)

Remittance

Remittance is available only in **Japanese yen by a credit card.**

Entrance charge..... \ Journal subscription (optional)..... \ _____
 Annual charge..... \ Mailing option: Air mail..... \ _____
 Additional Transaction (optional)..... \ SAL mail..... \ _____
 Total remittance..... \ _____

Credit Card: MasterCard VISA American Express Card number: _____ Expiry date(Y/M)____/

Credit Card Holder: _____ Signature: _____

Endorsement

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

I recommend this applicant for IEICE membership.

Endorser's name	Membership number	Endorser's signature	Date
-----------------	-------------------	----------------------	------

Endorser's name	Membership number	Endorser's signature	Date
-----------------	-------------------	----------------------	------

Send this form to:

The Membership Activities Section,

IEICE Headquarters Office, Kikai-Shinko-Kaikan Bldg., 5-8, Shibakoen 3 chome, Minato-ku, Tokyo 105-0011 JAPAN

From Editor's Room

● New editorial committee is now organized!

Newsletter editorial committee of IEICE Communications Society was organized once. IEICE Communications Society Newsletters of those days are only written in Japanese, and all of their articles are only businesslike conference programs from every technical committee. On that editorial policy, newsletter editorial committee members had acted as a liaison between publishing office and technical committees.

However, recently, oversea members had been on the increase. Moreover, WWW was developed and became popular, and many technical conference programs had been noticed by WWW. Therefore, previous newsletters services were no longer needed, and Communications Society had suspended publication its Newsletters in a few years ago.

As you know, newsletter is renewal and this Global News Letter is published now. And newsletter editorial committee are also changed its mission. Main editorial policy of Global News Letter is as follows.

- Write in English
- Interesting and exciting articles
- Many visuals

Now new newsletter editorial committee plans the index of the next newsletter, "Global News Letter Vol.4". Please look forward to the next issue.

IEICE Global News Letter Editorial Staff

Editorial Staffs of this issue

No special order is observed.

Chikara Ohta

Kobe University

Kazuo Hogari

NTT

Eisuke Kudoh

Tohoku University

Masazumi Ueda

NTT

Joji Maeda

Tokyo University of Science

Hiroyoshi Yamada

Niigata University

Naoaki Yamanaka

NTT

Director, Publications, IEICE Communications Society

Katsunori Yamaoka

Tokyo Institute of Technology

Director, Newsletter Publications, IEICE Communications Society

Call for Papers

Special Issue on **Internet Technology Series IV**



The IEICE (Institute of Electronics, Information and Communication Engineering "Transaction on Communications announces a forth coming special issue on "Internet Technology IV" to be published in March 2004.

The purpose of this special issue is to exchange recent information and to promote research and development on internet technology for further improvement of current internet information and for development of future advanced IP technology especially focusing on IPV6 technology. The special issue solicits paper submission from all people engaged in this field.

The topics of interest within the scope of this special issue include, but are not limited to be the following areas:

[Category 1] Internet technologies and architectures

- Internet architecture
- Routing
- Protocol
- Traffic Control issue
- Mobile IP
- System
- Experiments and applications
- Security CDN (Contents Distribution Network)

[Category 2] IP v.6 system and technologies

The deadline of the paper submission is **June 24, 2003**. Manuscripts should be prepared according to the style guidelines indicated in the Information for Authors attached to the IEICE Transactions. The style guidelines are also available at <http://www.ieice.org/eng/shiori/mokuji.html>. The length of a paper should not exceed eight printed pages in principle.

Online paper submission and registration is highly recommended (pdf file only).-> http://review.ieice.org/regist_e.wbt

However, attached file of e-mail is also available (Microsoft word, PS). ->

internet@lab.ntt.co.jp

When you send your manuscript, please include following information in your e-mail.

- the contact author's name, postal address, telephone number and e-mail address
- the manuscript's title, abstract and key words

Please note that special issue limits the number of papers, so some of the submission papers are deal with regular section.

Naoaki YAMANAKA, Ph.D

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3-9-11 Midori-cho Musashino-shi, Tokyo, 180-8585 Japan

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Kaori MAEDA (Hiroshima City University)

Motonori NAKAMURA (Kyoto University)

* Please note that if accepted for publication, all authors, including authors of invited papers, should pay for the page charges covering partial cost of publication. Authors will receive 100 copies of the reprint.