= A Serial Introduction Part 4= Winners of ITU-AJ Encouragement Awards

In May every year, the ITU Association of Japan (ITU-AJ) proudly presents ITU-AJ Encouragement Awards to people who have made outstanding contributions in the field of international standardization and have helped in the ongoing development of ICT.
These Awards are also an embodiment of our sincere desire to encourage further contributions from these individuals in the future.
If you happen to run into these winners at another meeting in the future, please say hello to them.
But first, as part of the introductory series of Award Winners, allow us to introduce some of those remarkable winners;

Suyong Eum
National Institute of Information and Communications Technology
suyong@nict.go.jp http://www.nict.go.jp
ITU-T/SG13/Q15 – Data Aware Networking

Standardization of Data Aware Networking (DAN) for Future Networks

These days, we tend to use networks more for content retrieval than for communication between people. To respond to this trend, ITU-T Recommendation Y.3001 states that Future Networks should be able to deal efficiently with enormous amounts of data in distributed environments regardless of where the data is located. This design goal is embodied in a new form of network architecture, which ITU-T refers to as Data Aware Networking (DAN).

My first job at ITU-T was to edit the Y.FNDAN draft Recommendation initiated at SG13/Q15 in February 2012, which was the first step toward standardizing DAN for future networks. Nowadays, network architectures similar to DAN are called Information Centric Networking (ICN). However, when DAN was introduced, they went under various different names such as Content Oriented Networking (CON), Named Data Networking (NDN), or Content Centric Networking (CCN). These names were globally unified into ICN due to the advent of ICNRG (Information Centric Networking Research Group) under IRTF (Internet Research Task Force) in August 2012. This is the reason why DAN and ICN have different names despite fulfilling similar objectives. In November 2013, the draft Recommendation Y.FNDAN was approved, and became ITU-T Y.3033 – Framework of data aware networking for future networks. This is the world's first standard Recommendation describing the high-level requirements of network architectures for efficient content dissemination.

In February 2014, a draft Supplement to ITU-T Recommendation Y.3033 was initiated in the name of Y.supFNDAN, which includes DAN use-case scenarios. The purpose of the draft Supplement is to clarify the requirements in the design of DAN architecture from use-case scenarios. I have actively contributed to and edited the draft Supplement, which currently (May, 2015) contains six use-case scenarios: 1) content dissemination, 2) sensor networking, 3) vehicular networking, 4) networking in a disaster area, 5) advanced metering infrastructure in smart grids, and 6) proactive video caching. As the draft matures, we are able to derive the requirements of DAN architectures, and in May 2015, this resulted in the initiation of draft Recommendation Y.DAN-req-arch – "Requirements and Architecture of data aware networking", which specifies the requirements of DAN derived from the use-case scenarios in Y.supFNDAN, and defines a functional architecture to fulfill its requirements.

As an editor of the ITU-T DAN series including the framework (ITU-T Y.3033), use-case scenarios (Y.supFNDAN), and requirements & architecture (Y.DAN-req-arch), I hope that these Recommendations will guide the international standardization of network architectures like ICN in the future.

Hiroshi Takechi
NEC Corporation
h-takechi@bc.jp.nec.com http://www.nec.com/
ITU-T SG17

Standardization of ID Management at ITU-T

Since 2001, I have been involved in work on ITU-T security standardization. I am currently engaged in standardization related to IdM as an Associate Rapporteur in ITU-T SG17 Q10.

There are various issues with ID management in its present form. For example, we are reaching the limits of authentication based on IDs and passwords. The standardization and popularization of other authentication methods are now being discussed. ID management schemes that work across multiple Internet services such as cloud services and social networks are also being studied and developed.

Protecting personal data and safeguarding privacy are becoming increasingly important. In the future, it may become completely impossible for businesses to operate unless they can reliably protect people's data and privacy.

It will also be necessary to consider how to allocate and manage the IDs of the tens of billions of sensors and other equipment that will be connected in cyberspace when the IoT (Internet of Things) era arrives. Ensuring compatibility between different ID management systems is another important issue. In ITU-T Q10/17, Recommendation X.1255 (Framework for discovery of identity management information) is being formulated as a framework for collaboration between ID management systems. Furthermore, we are studying further recommendations in order to realize cooperation between ID management systems in a more concrete fashion.

There are probably many different consortia and organizations around the world that are conducting research and development aimed at addressing the issues of IoT as well as other new issues that will arise. Through the activities of ITU-T Q10/17, I will carry on contributing to the standardization of ID management while cooperating with these related initiatives.

Hiroyuki Tsuji
National Institute of Information and Communications Technology
tsuji@nict.go.jp http://www.nict.go.jp
Signal Processing for Wireless Communication, Millimeter-wave Communication

R&D and Standardization of Wireless Communications between Air and Ground

The first ITU standardization agenda that I became involved with was the discussion of provisions for the review and operation of frequency sharing conditions for high-altitude platform stations (HAPS) in WRC-07. In WRC-12, I was also involved with another HAPS agenda related to resolution 734 of WRC-07, which was to identify the frequency bands used for HAPS relay lines (Gateway links). A HAPS platform is assumed to use an aircraft such as an airship to locate the station at an altitude of 20 to 50 km, and I remember it seemed strange at the time that HAPS were treated as fixed stations rather than airborne mobile stations. However, my experiences there were helpful in subsequent technical studies and standardization activities for satellite and aircraft communications that I was involved with.

At present, I am engaged in the research and development of mobile communication systems using high-frequency bands such as the millimeter wave band, which can provide broadband communication, in order to meet the recent demand for Internet connectivity and high-speed data communication on board fast-moving vehicles such as aircraft and bullet trains.

As a possible means for realizing this, we have been developing a direct wireless communication system that uses the 40 GHz band to achieve transmission speeds of over 100 Mbps between the ground and the air.

The results of this research were reflected in the new report ITU-R M.2282: "Systems for public mobile communications with aircraft" in ITU-R SG5 WP5A.

We are also trying to deploy this technology on railways, and are promoting research and development to provide broadband access to high-speed trains. To reflect this achievement, we have proposed a new ITU-R report that summarizes the relevant technology in ITU-R SG5 WP5A, and are currently performing studies for the completion of the report.

I will also work on unmanned aircraft communication systems, which have recently become a hot topic, and I hope to contribute to the research, development and standardization of these systems.

Takanori Higuchi
SKY Perfect JSAT Corporation
t-higuchi@sptvjsat.com http://www.jsat.net/en
ITU-R SG 4 WP 4A, WP 4B

Using Satellite Orbits and Radio Frequencies Efficiently and Economically

It is a great honor to receive the ITU Association of Japan (ITU-AJ) Encouragement Award. If I may, I would like to take this opportunity to express my sincere gratitude to everyone who gave me their support and cooperation over the years.

I first started working with the International Telecommunication Union (ITU) in July 2010 at the ITU-R WP 4A/4B meetings. Since then, I have contributed to studies on the technical and regulatory aspects of satellite services using geostationary satellites, and have participated in major conferences including the World Radiocommunication Conference 2012 (WRC-12). My current mission is to achieve favorable results for the Japanese satellite community at the forthcoming WRC-15, where some important issues for satellite services are to be discussed (including a review of satellite network coordination and notification procedures, and the allocation of new frequencies to certain satellite services).

I believe these issues are very important because geostationary satellites are fundamental infrastructure in countries that lack an adequate terrestrial telecommunications infrastructure. As a matter of fact, the satellite market has experienced steady growth worldwide, with increasing demand both from countries and from companies, especially ones that currently lack their own satellites but are willing to launch them so they can benefit from the significant advantages of satellites in promptly and efficiently establishing nationwide service coverage. On the other hand, as stipulated in Article 44 of the ITU Constitution, radio frequencies and satellite orbits, including geostationary satellite orbits, are limited natural resources, so new entrants cannot easily secure desirable satellite orbits and radio-frequencies. Article 44 also stipulates that these limited natural resources must be used rationally, efficiently and economically. In this regard, however we should also note that it might be unreasonable to modify the regulations simply to facilitate the entry of new satellites, because such treatments may affect the reliability and profitability of existing satellite services, resulting in a negative impact on the satellite industry itself as well as its customers. One of the most difficult aspects of studies and discussions about satellite issues in ITU-R is striking an appropriate balance between these contrasting demands and finding mutually agreeable solutions among all the parties concerned.

I hope my work can contribute to achieving these goals.

Homare Murakami
National Institute of Information and Communications Technology
homa@nict.go.jp http://www.nict.go.jp/
ITU-R WP5A, WP1B, IEEE DySPAN-sc 1900.4/4a

Cognitive Radio System (CRS) Standardization Activities

It's a great honor to receive such a prestigious award. I would like to start by acknowledging the research efforts of my colleagues whose work has made a real contribution to standardization activities, and the cooperation of the successive Japanese delegates on the ITU's cognitive ratio team with whom I have been working for almost eight years — Dr. Yoshino of Softbank Mobile, Mr. Kashiki of KDDI R&D Laboratories, and Mr. Shimbo of ATR.

At WRC-07, CRS was placed on the agenda for the following WRC[1], and a Question was also raised on this issue[2]. At ITU-R WP5A, work was therefore started on the preparation of a technical report on CRS. A group chaired by Dr. Yoshino was set up, and documents packed with highly accurate information were produced at each meeting. As discussion material for WRC-12, in November 2011, the parts of relatively old discussions that had been discussed at length were published in the first report[3], following which the chairman was replaced, the configuration of part 2 of the report was reviewed, and it was recommended that work was needed to make the report (which had grown to many pages) more orderly and concise. Three years later, the second report[4] was eventually published, marking the end of about eight years of activity.

Compared with other groups, there were more researchers participating in this group, and the ITU discussions led to the creation of joint studies and were also mentioned in the reports of overseas field trials. So I'm also very pleased with the feedback from these research activities. I hope that in the future I will be able to continue contributing by bringing the results of this sort of activity into discussions on standardization.

References
[1] WRC-12 Agenda Item 1.19:Software-Defined Radio (SDR) and Cognitive Radio Systems (CRS)
[2] Question ITU-R 241-2/5, "Cognitive radio systems in the mobile service"
[3] Report ITU-R M.2225, "Introduction to cognitive radio systems in the land mobile service," November 2011
[4] Report ITU-R M.2330, "Cognitive radio systems (CRSs) in the land mobile service," November 2014