= A Serial Introduction Part 2=
Winners of ITU-AJ Encouragement Awards 2016

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.

Kei Kawamura

KDDI Corporation
ki-kawamura@kddi.com http://www.kddi.com/english/
Fields of activity: ITU-T Q6/SG16 (Video Coding Expert Group

Development and standardization of video coding technology

It is a great honor for me to receive the ITU-AJ Encouragement Award (ICT Field), and I would express my appreciation not only to the Selection Committee but to all who helped me along the way.

The video coding field has a particularly well known international standard called MPEG-2 that was jointly developed by ITU and ISO/IEC JTC1. More recently, a state-of-the-art standard called High Efficiency Video Coding (HEVC) was developed by the Joint Collaborative Team on Video Coding (JCT-VC), a collaboration between ITU-T Q6/SG16 (VCEG) and ISO/IEC JTC 1/SC29/WG11 (MPEG). The first edition of HEVC was published in 2013, and subsequent editions have followed up to the present.

I began to participate in JCT-VC meetings in March 2011, and have made regular technical contributions. Taking over the job of ad-hoc group co-chair and editor, I led discussions leading to and standardization of scalability extensions and multiview extensions of HEVC. Parts of these extensions must be backward compatible and interoperable with codec products already on the market. Indeed, interoperability is essential not only for standardization but also for video coding technology. Video encoding is realized by proprietary technology of each company, while the decoding process is specified in the standard since this is lossy coding technology.

The HEVC series is almost completed, and discussion has now turned to future video coding (FVC). The objective of FVC is to achieve further bandwidth reduction without sacrificing visual quality. Until HEVC standardization, double performance (50% bandwidth reduction) was regarded as a mandatory requirement. Recently, over-the-top (OTT) video services have become very popular. OTT providers bypass traditional distribution and deliver content directly via the Internet. With a 1.5 times performance gain (a 33% bandwidth reduction), this development will be welcomed by the market. Virtual reality (VR) video is another attractive use-case. VR content requires ultra-high 4K or 8K resolution (4000 pixels by 2000 pixels or 8,000 pixels by 4,000 pixels). Such high resolution video has considerable room for bandwidth reduction and is a very challenging research target.

In the development of FVC, I have been designated the co-chair of the requirements ad-hoc group in VCEG. In this capacity, I will lead discussions of future video communication services for the 5G era. Development of the new FVC standard is scheduled for completion by the end of 2020. As an expert in the field, I am committed to the development of new recommendations and standards supporting attractive new services for the general public.

Tetsuya Kawanishi

National Institute of Information and Communications Technology (NICT)
kawanishi@nict.go.jp
http://www.nict.go.jp/en/
Fields of activity:
International standardization of radio-over-fiber technologies

Toshiaki Kuri

National Institute of Information and Communications Technology (NICT)
kuri@nict.go.jp
http://www.nict.go.jp/en/
Fields of activity:
International standardization of radio-over-fiber technologies

Toward integration of wired and wireless communication technologies

We have been working at the NICT on international standardization of radio-over-fiber (RoF) technologies for more than 10 years. Our initial goal was standardization of measurement technologies necessary needed to evaluate key devices used in RoF systems in the IEC. We have made significant contributions to IEC standards for evaluating the characteristics of optical modulators and photo-detectors photodetectors for converting electrical signals into optical signals and vice versa. We also began work on system architecture standards and have helped draft technical documents supporting system integration of wired and wireless technologies in the ASTAP and the AWG. More recently in February 2013, we became involved with the ITU-T. At that time, it was thought that RoF technology could be applied to access networks, so RoF was taken up by a group charged with handling optical systems for fiber access networks (Q2/15). In February 2013, we proposed our first contribution relating to RoF technologies, potentially including analog technologies. However, most discussion of optical access networks assumes digital transmission technology, so RoF was little understood and agreement on our proposal could not be achieved. There was clearly a lack of basic understanding about RoF technology, so we proposed that we prepare some basic technical documents explaining the technology at the Q2/15 interim meeting in May 2013. This proposal was agreed upon and officially accepted as a new work item at the ITU-T SG15 plenary meeting in July 2013. The proposal and agreement went smoothly thereafter, and two years later ITU-T G-Series Recommendations Supplement 55 (G Suppl. 55) entitled "Radio-over-fibre (RoF) technologies and their applications" was formally accepted at the ITU-T SG15 plenary meeting in July, 2015. At this same meeting, it was agreed that work would commence on new standards for RoF systems, and discussion of these RoF standards now continues. Activities within ITU are clearly divided between the ITU-T handling wired communication and the ITU-R handling wireless communication. Thanks to our proposal, the ITU-T began delving into standardization of wireless communication, thus signifying a new direction unifying the fields of wired and wireless communication in the physical layer.

Confident that radio-over-fiber (RoF) technology will become increasingly important for international 5th-generation (5G) and beyond, as well as for other future radio communication systems, we will continue to contribute to standardization in this valuable field.

Ashiq Khan

NTT DOCOMO, INC.
khan@nttdocomo.com
https://www.nttdocomo.co.jp/english/corporate/technology/rd/rdcenter/
Fields of activity: Network Functions Virtualisation (NFV)

Standardization of NFV-based Telecom Networks

It is a great honor for me to receive the ITU-AJ Encouragement Award (ICT Field), and I would like to express my appreciation not only to the Selection Committee but to all who have helped me along the way.

As a network virtualization specialist, my participation in the standardization of telecom network virtualization in the ETSI Industry Specification Group Network Functions Virtualisation (ETSI ISG NFV, ETSI NFV below) began in 2013. ETSI NFV was established in November 2012 to develop a specification for virtualized telecom networks and their operation.

Within the first year, ETSI NFV evolved into a community of over 300 participants. During the first two years, we focused on defining use cases, deriving requirements, and determining the NFV architecture. Since then, we have focused on the specification of Management and Orchestration (MANO) functions, which control the operation of virtualized telecom networks. Over the next two years, implementation details and protocol-level standards will be specified. So far, ETSI NFV has delivered more than 20 Group Specifications (GSs), and more than 400 of my own contributions have been accepted.

Compared to conventional voice and data communications, services offered over telecom networks have greatly diversified, including high-definition video, Machine-to-Machine (M2M) communications, among other services. Accommodating such versatile services requires flexibility in the network. Flexibility is also required to ensure service availability during large-scale natural disasters. NFV, based on network virtualization, provides this much-desired network flexibility to network operators. Virtual Machines (VMs) can be instantiated and migrated on demand. By using Software-Defined Networking (SDN), network paths can be dynamically established and re-established to ensure that the connectivity to the VMs is maintained. Operating such a flexible network is a challenging task. ETSI NFV's role is to provide global standards for the flexible operation of a virtualized telecom network.

Another unique initiative in which I am involved is an open source community called Open Platform for NFV (OPNFV). OPNFV is responsible for developing an NFV reference platform by using only open source software. So far, we have delivered three OPNFV releases. The OPNFV Doctor project, initiated by me, has already completed its feature development in OpenStack.

As ETSI NFV will now focus on determining implementation details, using OPNFV as a reference platform for further developments will make good sense. Being committed to both of these communities, one of my future tasks will be to bring these two communities even closer together.

Shoichiro Oda

Fujitsu Limited
oda.shoichiro@jp.fujitsu.com http://www.fujitsu.com/
Fields of activity: ITU-T SG15 WP2 Q6 100G-class optical interface

Contribution to 100G-class optical interface standardization activity in ITU-T

Since November 2011, I have been involved with Question 6 (Q6) in ITU-T SG15 WP2 (Study Group 15, Working Party 2), the WP in charge of drafting an optical interface (I/F) for terrestrial optical transmission systems, and in 2012 I became the editor of Supplement 39 (G-Sup39) describing design and engineering considerations for optical transmission systems including digital coherent technology that has now been adopted as the basis for high-capacity, long-distance optical transport networks.

The most important work in addressing Question 6 involves drafting a recommendation for 100G-class optical interfaces. Ongoing deliberations began four years ago in 2012 about the time I got involved in ITU-T standardization activities, and work has continued on this recommendation up to the present. 100G optical transmission systems have adopted new and very different technologies from the current standard 10G optical systems (e.g., digital coherent technology), and this has required considerable time to verify the measured data attached to the proposed contribution. Utilizing knowledge gained while researching and developing digital coherent optical transmission systems, I am in a perfect position to facilitate smooth deliberations by pointing out defects and proposing improvements to the evaluation measurement system, and taking actions that raise questions in assessing the measurement results.

The demand for terrestrial optical transmission systems that serve as the backbone for ICT infrastructure will only continue to grow in the years ahead. The work I do in developing international recommendations and standards for high-capacity terrestrial optical interfaces is also becoming more important, and this has strengthened my commitment to continue representing Japan's perspective in developing and deploying global optical transmission infrastructure.

Satoshi Oode

NHK (Japan Broadcasting Corporation)
oode.s-hy@nhk.or.jp http://www.nhk.or.jp/strl/index-e.html
Fields of activity: ITU-R WP6B, WP6C (Audio)

Standardization of Advanced Sound Systems for Next-Generation Broadcasting Services

It is a great honor to receive the ITU Association of Japan Encouragement Award, and I would like to express my appreciation for the award and to all the people who have supported me.

Since 2014, I have taken part in meetings of ITU-R SG6 (WP6B and WP6C), and have been in charge of the standardizations for advanced sound systems including the audio-related metadata, audio file format and subjective evaluation method.

"Advanced sound systems" is a general term for next-generation audio systems beyond the 5.1-multichannel sound system. These systems include both channel-based sound systems such as the 22.2-multichannel sound system used in 8K Super Hi-Vision broadcasting and the latest object-based sound systems used in the cinema industry. Recommendation ITU-R BS.2051, which specifies loudspeaker layouts for advanced sound systems, was published in 2014, but the specifications for the renderer, an essential device to reproduce object-based sound signals, are currently under consideration. I was involved in revision of the Recommendations for advanced sound systems with priority on channel-based sound systems in time to start 4K/8K test broadcasting. The most important and highest priority issue was to revise Recommendation ITU-R BS.1770, which specifies the measurement algorithm for objective multichannel loudness.

Currently, the loudness measurement algorithm for up to 5.1-multichannel sound is widely used in the digital broadcasting services worldwide to ensure that the sound volume does not suddenly change when the broadcasting program changes. I developed an expanded algorithm with position-dependent channel weighting coefficients that remains compatible with the existing algorithm, which can calculate the loudness of any channel-based sound system. However, when Japan proposed the revision of Recommendation ITU-R BS.1770 to calculate the loudness of 22.2-multichannel sound, some countries not planning to adopt advanced sound systems were concerned that it might have an adverse effect on domestic standards while other countries promoting object-based sound systems expressed reservations about developing a new algorithm including object-based sound.

Eventually, Recommendation ITU-R BS.1770 was revised on the basis of the Japanese contributions. This was because the Recommendation provided significant technical advances and can also be attributed to savvy negotiations. It is important to form strong relationships with fellow overseas associates with whom one can negotiate favorable conditions in international standards. In my capacity as Chairman of the Drafting Group and Rapporteur Group, I gained the trust of many close associates who supported the revision in negotiations. I remain committed to standardization work, and will continue to make contributions supporting implementation of advanced sound systems for next-generation broadcasting services.