

Toward Universal Communication

With the development of communication system and device technologies such as optical and wireless communications and IC/RF tags, the ubiquitous information and communications infrastructure has been spreading rapidly, enabling the use of information network systems “anytime and anywhere.” The rapid progress of broadbandization has also enabled transmission of large-volume information, such as ultra-high-resolution images and stereoscopic images. Moreover, the recent emergence of the new communications technologies such as Web 2.0 has triggered changes in social activities.

However, viewing the current situation from the perspective of whether “anyone” can use these information network systems freely and flexibly, it is apparent that there are various barriers as follows.

1. Language barrier: Information resources worldwide can be accessed via the Internet; however, different languages hamper effective use of the information available, as well as smooth communication.
2. Barrier relating to the quality of information: The Internet contains much valuable, useful information. However, it also contains incorrect information and, in some cases, false information intended to mislead or deceive. It is therefore necessary to evaluate the value of information with credibility from the vast amount of information available.
3. Barrier of capability: Due to the increasing sophistication and multi-functionality of communication systems, the operation of such systems is becoming increasingly complex (for example, mobile phones and PC). Without considerable knowledge and experience, it is impossible to make full use of the functions of those complicated systems. The digital divide is a popular problem around us.
4. Barrier relating to the integration of cyberspace and real world: With the growing importance of the information network society, inconsistency between information in the society and the real world has caused major problems. There is an increasing demand for the development of technologies and systems to enable seamless integration of cyberspace and the real world.
5. Barrier of distance: The advancement of communications technologies is crucial, from text-based and image-based telecommunications to the “ultra-realistic communication

technology” that enables transmission of the five senses. It is increasingly necessary to create an environment that gives users a realistic sense of “being there,” by transcending the barrier of distance.

The more advanced information network systems become, the more obvious these barriers will become.

In 2005 the Ministry of Internal Affairs and Communications advocated the basic concept of “Universal Communication,” with the aim of overcoming these barriers and creating a more human-centered communication environment. In response to the Ministry’s initiative, the National Institute of Information and Communications Technology (NICT) in April 2006 established the Knowledge Creating Communication Research Center and the Universal Media Research Center, both of which have since been actively pursuing research and development toward the realization of universal communication. The Knowledge-Creating Communication Research Center strives to build a communication environment that enables users to overcome all barriers, such as those involving language, knowledge and capability, based on an advanced information communication infrastructure. Specific R&D themes include: multi-lingual translation, voice and nonverbal communication, information analysis based on credibility evaluation, and human-friendly communication environment. The Universal Media Research Center focuses on R&D relating to the ultra-realistic communication technology, ranging from the basic research such as clarifying the human perceptual and cognitive mechanisms of the five senses (seeing, hearing etc.) to construct an ultra-realistic communication system using 3D images and sounds.

This Symposium aims to introduce the progress of NICT’s R&D projects on the universal communication and to promote and expand efforts toward realizing a universal communication society in Japan and in the international communities. We sincerely welcome you to participate this symposium.

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