Year 2030 : Symbiosis between Human Life and Nature via ICT Towards Creation of Super Smart Information Society

Norio Shiratori,
IEEE Fellow
Professor of Chuo University, Tokyo and Visiting Professor of Waseda University, Tokyo
Professor Emeritus of Tohoku University, Sendai

Abstract

1. Symbiotic Computing

In the 21st century, ICT (Information Communication Technology) such as smartphones and internet has rapidly changed the structure of human society and those technologies will continue to make a great impact on our information society. In this talk, we discuss the relationships between human life and nature via ICT. As one typical example of those relationships, we first introduce our original concept of the symbiotic computing, proposed in the early 1990s aiming at a creation of the symbiosis between human life and nature towards a sustainable information society.

2. Energy-savings of an Underpopulated City

Based on the concept of symbiotic computing, we have promoted 2 governmental projects funded by Ministry of Internal Affairs and Communications, Japan. One is the "Kurihara Green Project[4] (2010-2011)." aiming at energy-savings of an underpopulated city. In this project, Kurihara city in Miyagi prefecture was used as a test site of our field experiments because it is one of a typical example facing with problems of low birth rates and rapid population aging. Through a series of field experiments, we tried to accomplish an effective implementation of ICT and its applications to services of city office to its citizens. Our experiments successfully demonstrated that achieving the two objectives, 1) improving the QoL(Quality of Life) of the residents and 2) reducing environmental burdens by reducing car travels of citizens to their city office, at the same time is possible.

3. Energy-Savings of Information Systems

The other is "Energy-Savings of Information Systems [5] (2011-2014) ." In this project, we have investigated a new network management system without any smart taps, expensive measuring devices, and successfully developed a fundamental technology to cut wasted electric power consumption. Concretely, we have successfully developed an energy measurement and management system without smart-taps, and enabled cost reductions of the new created system under one-tenth, compared with the existing systems with smart-taps.

4. Never Die Networks

Moreover, in order to create a sustainable information society, we proposed the concept of Never Die Networks in 2003, and investigated disaster-resilient communication systems [1,2,3] . On March 11, 2011, I have experienced the East Japan Great Earthquake : Magnitude 9.0 earthquakes and tsunami caused devastating damages on the northern area of Japan, 15,841 deaths and 3,490 missing. We are now promoting the governmental project funded by Ministry of Education, Culture, Sports, Science and Technology(MEXT), JSPS Grants-in-Aid for Scientific Research (A) " Never Die Networks (2014-2017)."

References

[1] Norio Shiratori, Noriki Uchida, Yoshitaka Shibata, Satoru Izumi, "Never Die Network towards Disaster-resistant Information Communication Systems," ASEAN Engineering Journal Part D, Vol.1, No.2, pp.1-22, March 2013 **[Invited Paper**].

[2] Yoshitaka Shibata, Noriki Uchida, Norio Shiratori, "Analysis and Proposal of Disaster Information Network from Experience of the Great East Japan Earthquake," **IEEE Communications Magazine**, March 2014, pp.44-48 **[Invited Paper]**.

[3] Norio Shiratori, "Never Die Networks," Joint Workshop on Disaster Management, Feb.2014, Tokyo **[Keynote Speech]**.

http://www.shiratori.riec.tohoku.ac.jp/~norio/program_2014GITSJointWS.pdf

[4] Norio Shiratori, Kazuo Hashimoto, Debasish Chakraborty, Hideyuki Takahashi, Takuo Suganuma, Naoki Nakamura, and Atushi Takeda"Kurihara Green ICT Project -- Towards Symbiosis between Human's Life and Nature"Journal of Internet Technology(JIT), Vol. 12, No. 1, pp.1-11, 2011 **[Invited Paper].**

[5] Norio Shiratori, "Never Die Network and Green Computing Towards Disaster-Resilient Information Communication Systems, 7th Annual International Conference on Information Technology and Electrical Engineering (ICITEE2015), Chiang Mai, October 2015. **[Invited Speech]**.