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# BP-6: Software Radios for New Generation Radio Communication

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## Foreword

This is a special report of seven panel discussions sponsored by Communications Society in 2008 IEICE General Conference held in Kitakyusyu-shi, Japan in this March.

Hot topics related to advanced communication technologies were extensively discussed by the experts together with the participants to explore not only the future of communications technologies but also the deployment of new systems and services.

## 1. Introduction

In the morning of March 21<sup>st</sup>, the panel session entitled “Software Radios for New Generation Radio Communication Systems” was held as a program of 2008 IEICE General Conference. This panel session, proposed and prepared by the technical committee on Software Radio, had five panelists from industry and academia. After their introductory talks of 15 minutes each, they exchanged ideas on various topics in the field of software radio and answered questions from the floor.

## 2. Introductory Talks

The chair of session, **Prof. Katayama**, introduced the five experts and they made short introductory talks on software radio and related technologies as follows.

**Dr. Kashiki** from KDDI Laboratories Inc. briefly reviewed the history of software radio, and explained cognitive radio (CR) as future wireless technology. He summarized necessary technical issues on software radio for CR.

**Dr. Murai** from Nippon Ericsson had presentation on implementation of software defined radio (SDR) in cellular radio base station.

**Mr. Ikekawa** from NEC introduced recent developments on LSI for base-band digital signal processing for flexible wireless infrastructures.

**Dr. Yoshida**'s talk was about SDR for multimode terminals. He mentioned that a multi-mode multi-band wireless terminal is required for future communication systems, and then presented technical issues necessary to be solved.

As the last speaker, **Prof. Sakaguchi** from Tokyo Institute of Technology talked about CR for future wireless network. He introduced CR as a technique that realizes cohabitation of a new radio system in the same frequency band of legacy systems by sensing wireless environment and adapting its radio specifications.

## 3. Discussion

Following the talks, the panelists had discussion stimulated by questions from the floor. Examples of the variety of (but not all of) topics discussed are as follows.

- Experiences or lessons learned on software radio. Especially knowledge on failures in Japan and other countries.

- What are special technical issues for realization of cognitive radio and system cohabitation?

- Where is an optimum balance between software and hardware, analog RF and high-speed digital, single multiband and multiple singleband in RF?

- Is technology the obstacle of software radio? In other words, regulatory/economy issues.

- Necessity of side-information, or assistance of wireless environment sensing.

## 4. Reference

- [1] K. Kashiki, M. Nohara, K. Takeuchi, “Future Wireless Communication Systems and Role of Software Defined Radio,” BP-6-1, 2008 IEICE General Conference, March 2008.
- [2] P. Olanders, H. Murai, “Application of Software Radio Technology to Cellular Radio Base Station,” BP-6-2, 2008 IEICE General Conference, March 2008.
- [3] M. Ikekawa, “Digital Baseband Processing LSIs for Flexible Wireless Infrastructure Systems,” BP-6-3, 2008 IEICE General Conference, March 2008
- [4] H. Yoshida, ”Software-Defined Radio for Multimode Terminals,” BP-6-4, 2008 IEICE General Conference, March 2008.
- [5] K. Sakaguchi, ”Study on Cognitive Radio for Future Wireless Networks,” BP-6-5, 2008 IEICE General Conference, March 2008.

## Organizer of the Panel



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