

INTRODUCTION OF RESEARCH ACTIVITIES ON WIRELESS COMMUNICATIONS IN EJUST CENTER

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The Center for Japan-Egypt Cooperation in Science and Technology (E-JUST Center) was established in August 1, 2010 in Kyushu University. The EJUST Center has the following missions; (1) the first mission is to collaborate with the Department of Electronics and Communications Engineering (ECE) in the E-JUST University (Egypt-Japan University of Science and Technology), a national university in Arab Republic of Egypt, on its education and research activities as its Japanese counterpart partner. (2) The second mission is to strongly promote the EJUST Project, a national project between Japan and Egypt, as an executive steering member of Japanese E-JUST supporting university committee. To execute an educational support for the E-JUST University effectively, we have started a short-term students' travel program to Japan from EJUST University and have also started collaboration research activities with faculty of ECE department in EJUST University. The center provides advanced analytical as well as technological knowledge in various fields of electronics and communication engineering. The center is currently taking care of the students in mainly three fields: (i) radio frequency analog and mixed signals LSI technology, (ii) VLSI engineering for multi-core digital processor, and (iii) wireless communication systems and networks.

In this presentation, topics related to our research activities on wireless communications in EJUST Center at Kyushu University are briefly introduced; we have collaborated with ECE department in E-JUST University for research activities on the field of wireless communication systems. One of topics is wideband spectrum sensing techniques for cognitive radio applications; to enable accurate sensing of the wide-band spectrum, we proposed a cooperative compressive spectrum sensing technique based on compressive sensing theory which reduces required hardware complexity at each sensing node while keeping the spectrum sensing capability. In this technique, cooperated sensing nodes are classified into different sensing groups depending on the quality of the reporting channel between the sensing node and the fusion center (FC). To take a global decision about spectrum occupancy, each node uses its local sensing matrix, which is a part of a global sensing matrix at the FC to sense the primary user signal. The FC classifies and rearranges the compressed data to formulate one global measurement vector which is used to estimate the wide-band signal spectrum. Simulation results show that the proposed receiver provides higher detection probability at the same probability.

of false alarm. The other topics are also briefly presented such as a peak power reduction technique for power efficient wireless communication systems and a relay selection and power allocation technique for energy efficient bidirectional relay network.

Through the above-mentioned activities, the EJUST center would establish some international education cooperation such that E-JUST educates the next-generation faculty who teaches and advises their students, or even come to Japan for training and/or other cooperation.

Osamu Muta received a B.E. degree from Ehime University, Ehime, Japan, in 1996, an M.E. degree from Kyushu Institute of Technology, Fukuoka, Japan, in 1998, and a Ph.D. degree from Kyushu University, Fukuoka, Japan in 2001. In 2001, he joined the Graduate School of Information Science and Electrical Engineering, Kyushu University as an assistant professor. Since 2010, he has been an associate professor in Center for Japan-Egypt Cooperation in Science and Technology, Kyushu University. His current research interests

include signal transmission processing techniques for high-speed wireless communications and power-line communications, and nonlinear distortion compensation techniques for high-power amplifiers. He received the 2005 Active Research Award for excellent presentation from IEICE Radio Communication Systems.