International Standardization of Cognitive Radio Systems: ITU, IEEE and ETSI

Webcast Type:
Tutorial
2010 The IEEE International Symposium on Dynamic Spectrum Access Networks
Webcast URL:
javascript:openWin('https://dl.comsoc.org/comsocdl/DRM-authentication.action?path=LoginUser&tutorialid=892803','500','700','Shopping Cart')
Status:
Free for Members
Duration:
211minutes
Presentation Date:
Tue, 04/06/2010
Free to Members Date:
Wed, 04/06/2011

Instructors:
Stanislav Filin, Hiroshi Harada, Homare Murakami, Kentaro Ishizu
National Institute of Information and Communications Technology

Abstract: The current radio environment is characterized by its heterogeneity. Different aspects of this heterogeneity include: multiple operators and services, various radio access technologies, different network topologies, broad range of radio equipment, and multiple frequency bands.

Such environment has a lot of technical and business opportunities. The examples are: joint management of several radio access networks within one operator to balance load of these networks; detecting and using unused spectrum in the allocated frequency bands without interrupting the operation of the primary users of such frequency bands; spectrum trading between several operators.

To exploit such opportunities, the concept of cognitive radio system (CRS) has been developed. In general CRS can be characterized as - a radio system employing technology that allows the system: to obtain knowledge of its operational and geographical environment, established policies and its internal state; to dynamically and autonomously adjust its operational parameters and protocols according to its obtained knowledge in order to achieve predefined objectives; and

to learn from the results obtained.

Given such definition many CRS usage scenarios and business cases are possible. This has triggered a lot of standardization activity on all levels, including ITU, IEEE, and ETSI, where each of this organizations consider multiple CRS deployment scenarios and business directions. This tutorial shows a big picture of all international standardization
of CRS performed at the moment. Understanding of these standardization activities is very important for both academia and industry in order to select important research topics and promising business directions.

The tutorial has three parts covering CRS concept overview, standardization, and implementation. The overview part is very important to understand the other parts. It gives introduction to CRS, including key technologies like Cognitive Pilot Channel, white space and spectrum sensing. The standardization part covers ITU, IEEE and ETSI activities on developing specifications for different deployment scenarios and components of CRS. The CRS implementation part of this tutorial describes several examples of the first CRS implementations.

Authors:
Filin, Stanislav
Harada, Hiroshi
Murakami, Homare
Ishizu, Kentaro
