Special Issue on Cognitive Radio

A cognitive radio (CR) is a radio that is aware of the environment in which it is operating and which can dynamically adapt its operating parameters to make best use of available radio and network resources to respond to opportunities and changes in the network. Cognitive radios use sophisticated decision-making techniques and reasoning processes to determine responses and actions.

Cognitive radios have a wide range of applications. Currently, a key driver for cognitive radio research is the field of dynamic spectrum access ranging from opportunistic access of spectrum white space and spectrum sharing techniques to spectrum commons and open spectrum approaches. The increasing cost and perceived scarcity of spectrum has made it a major focus of research in the wireless signal processing field. Spectrum resource optimization has always been a central argument for standards definition for 2G, 3G and other wireless systems. Cognitive radio embraces the notion of making best use of radio resources and at the system level aims to give some autonomy to future radio systems to achieve the key objective of better usage of radio resources. Cognitive radios are therefore devices that challenge the current static and restricted way in which spectrum is managed.

On a general level, cognitive radio brings a level of smartness and intelligence to radio that can be exploited at multiple levels. A cognitive radio system has the potential to manage its power resources effectively, anticipate environment changes and plan responses, facilitate vertical hand-over across networks etc. and generally facilitate more dynamic and responsive communication processes.

Consequently, this issue is dedicated to all research activities contributing in one way or another to the cognitive radio field: signal processing, communication systems design, spectrum management, decision making, sensing means, context awareness, regulatory policy, economics measurement and applications for cognitive radio.

The following list of topics is proposed but is not restrictive:
- advanced signal processing techniques for CR,
- spectrum use optimization,
- opportunistic radio,
- spectrum use rules,
- cross-layer optimization for CR,
- cognitive radio architecture for equipment,
- cognitive radio scenarios,
- sensors for CR,
- cognitive networks,
- cooperative networks,
- decision making for CR,
- game theory,
- heuristics,
- learning for CR,
- context aware terminals,
- cognitive radio sensing in the large,
- enabling SDR technology for CR,
- measurement for CR,
- cognitive radio standards,
- CR applications

Important dates
Manuscript submission: 1st June 2008
Publication of the Special Issue: mid-2009

The papers must be written in English and describe original research not published nor currently under review by other journals or conferences. Articles are expected to be in English and 15-25 pages each (including abstract, all figures, all tables, and references). All submitted papers, if relevant to the theme and objectives of the special issue, will go through an external peer-review process. They will be evaluated by 3 reviewers. Submissions should include an abstract and the e-mail address of the corresponding author. Articles will be submitted in PDF format to: redaction@annals-of-telecommunications.com.

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