Call for Papers
IEEE Network

Special Issue on
Networking over Multi-Hop Cognitive Networks

Background:

In recent years, the exponential growth of unlicensed band usage has prompted possible wireless spectrum shortage. Moreover, today's wireless networks are characterized by fixed spectrum assignment policies, which often lead to wasting large spectrum portions due to sporadic utilization of the licensed users (according to FCC, only 15% to 85% of the licensed spectrum is utilized on the average). This situation has motivated and pushed forward the development of novel low-power wireless Cognitive Radio transceivers with the capability of changing their transmitter parameters operating spectrum, modulation, transmission power and communication technology) based on interaction with the surrounding environment.

Cognitive Radio Networks (CRNs) based on nodes equipped with cognitive transceivers have consequently emerged as viable architectural solutions to solve current wireless network problems resulting from the limited available spectrum and the inefficiency in the spectrum usage by exploiting the existing wireless spectrum opportunistically.

Scope and Contributions:

This special issue aims to consolidate and disseminate the latest developments and advances in the emerging area of Multi-hop CRNs, which is defined as a collection of cognitive transceiver-equipped nodes forming a multi-hop communication network. The main focus of this special issue is on networking aspects of multi-hop CRNs where the information needs to be relayed over multiple wireless links. The operation of Multi-hop CRNs is not limited to the discovery and allocation of wireless resources while avoiding service disruption for primary users. Additional tasks must be accomplished to sustain end-to-end communication, including identification of sets of relay nodes, ensuring that required bandwidth is available over all necessary links, and regulating resource sharing among all flows in the network. Most importantly, these goals must be achieved while coping with negative effects of frequent link outages due to primary user access. Preferably, the multi-hop CRN must also ensure that flow requirements,
Such as bandwidth, delay, and jitter bounds, are met.

This special issue provides opportunities for the research community, the standardization bodies, and the industry to showcase the-state-of-the-art of the research on networking aspects of Multi-hop CRNs, implementation studies, and feasibility analyses. Moreover, since the success of CRN also depends on spectrum regulatory aspect, we also solicit critical contributions addressing the Multi-hop CRM architecture as it relates to spectrum competition under regulated, partially regulated or unregulated competitive environments.

While the nature of the multi-hop CRNs necessitates high levels of interaction and dependency between the physical layer and protocols and solutions at MAC layer and above, the main focus of this special issue is the networking aspects of multi-hop CRNs. Therefore, the design of cognitive transceivers and hardware, signal processing techniques, modulation and coding methods, physical layer channel models, as well as networking issues primarily concerning single-hop CRNs fall outside the scope of the special issue.

We solicit papers written in a tutorial and survey style, accessible to The non-expert, presenting the state of the art. Specifically, we seek submissions on the topics of:

o Medium access control for multi-hop CRNs

o Routing solutions for multi-hop CRNs

o Real-time communication protocols for multi-hop CRNs

o Cross-layer design of communication protocols for multi-hop CRNs

o Centralized and distributed dynamic spectrum management and spectrum leasing

o Performance evaluation and modeling of multi-hop CRNs

o Regulatory Aspects and CRN Architectures

o Experiences from testbed and proof-of-concept systems

Schedule for Submission:

Paper Submission Deadline:	November 15, 2008
Feedback to Authors:	February, 15 2009
Publication of the Special Issue:	Second Half of 2009

Authors must follow the IEEE Network Magazine guidelines regarding the manuscript and its format. For details, please refer to the "Author Guidelines" at the IEEE Network Magazine Web site at http://www.comsoc.org/pubs/net/ntwrk/authors.html. The manuscripts must be written in English and submitted electronically in PDF format with a separate cover letter, which contains the paper title, authors, affiliations, contact information, a 250-word abstract and 3-5 keywords,via email to ieee-network-si@ece.osu.edu before the deadline (November 15th 2008). Accepted papers will also be included in Network Interactive (NI) the online version of Network Magazine.

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