

Special Section of IEEE Transactions on Vehicular Technology **“Achievements and the Road Ahead: The First Decade of Cognitive Radio”**

The paradigm used by regulatory bodies for spectrum management thus far has been “good fences make good neighbors”. Although this ensures minimum interference, recent growth in wireless applications and technologies has caused frequency allocation tables to become saturated. Moreover, as various measurement campaigns have shown, spectrum is generally underutilized at any given location.

Cognitive Radio (CR) is a viable paradigm to increase spectrum utilization through leveraging secondary spectrum access. Upon its conception in 1999, CR was intended to involve radio-frequency environment sensing, model-based reasoning, and learning and acting according to this knowledge in order to improve communications aspects. Coupled with the advantages and flexibility of CR systems and technologies, there is an ever-growing interest around the world in exploiting CR-enabled communications in vehicular and transportation environments. Through the integration of CR and CR Networking (CRN) into vehicles and associated infrastructure, Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) communications, as well as many other emerging “Killer Applications”, can be expected. CR and CRN, based upon enhanced intelligent interactions with the transportation system, interactions among vehicles, and even interactions among radios within vehicles, will help improve radio resource and energy efficiency, road traffic management, network management, vehicular diagnostics, road traffic awareness in applications such as route planning, mobile commerce, and more.

This special issue aims to study important achievements in CR in the last decade, present solutions to remaining challenges, and furthermore to investigate the significant potential for CR to be of use in vehicular domains. Topics of interest for this special issue include, but are not limited to:

- CR enhanced V2V and V2I communications,
- CR enhanced vehicular ad hoc networks,
- CR enhanced radio resource management and QoS support in vehicular environments,
- PHY and MAC techniques for CR,
- Cognitive radio networking,
- Information theoretic analyses of CR,
- Interference mitigation in shared spectrum environments,
- Security issues for CR,
- Software Defined Radio (SDR) and reconfigurability,
- Standardization efforts such as IEEE 802.22, IEEE 1900 (SCC41), IEEE 802.16h, etc.,
- Higher layers and interdisciplinary research on CR (AI, computer vision, neural networks, etc.),
- Intelligent radio and cognition cycle considerations,
- Coding for CR channels,
- Biological-inspired networking for CR,
- Study of the applications and social impacts of CR, such as on public safety,
- Cooperative networking with shared resources,
- Cross-layer designs and architectures for CR,
- Beam-forming and MIMO for interference avoidance in the CR context,
- Self-organizing networks and autonomic communications,
- Policy and policy languages for shared spectrum management,
- Spectrum sensing techniques,
- Ultra-wideband for spectrum sharing in CR,
- Game theoretical analysis for CR.

Timeline:

- Paper submission deadline: May 22, 2009,
- First review deadline: August 1, 2009,
- Revised paper submission deadline: October 1, 2009,
- Second and final review deadline: December 1, 2009,
- Final manuscript submission deadline: January 15, 2010,
- Publication: May 2010.

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