

Tutorial Track 3: Cognitive Radio Systems

Cognitive Networks and Dynamic Spectrum Access

Authors & Affiliation

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Short Tutorial Description

This tutorial will provide an overview of current research on cognitive radios and cognitive networks. A cognitive radio is a transceiver that is aware of its environment, adaptive, and capable of learning from experience. The development of cognitive radios is largely motivated by the desire to manage the spectrum more efficiently and dynamically. Cognitive networks are capable of perceiving current network conditions and then planning, learning and acting according to end-to-end goals. Cognitive networks are motivated by the complexity, heterogeneity, and reliability requirements of tomorrow's networks, which are increasingly expected to self-organize to meet user and application objectives. Dynamic and opportunistic access to spectrum has emerged as the primary application of cognitive networks. By defining cognitive radios and networks, examining their relationship to other technologies, discussing critical design issues, and providing a framework for implementation, we aim to establish a foundation for further research and discussion. The tutorial will also discuss both technical and policy issues involved in the use of cognitive radios for dynamic spectrum access.

Potential Audience

The potential audience includes academic, industrial, and government researchers in the wireless communications and networking fields who have an interest in cognitive radios and networks and on dynamic spectrum access. The only pre-requisite for the tutorial is a working knowledge of concepts from wireless communications and networking.

Speakers Biography

Luiz A. DaSilva, Ph.D.



Luiz A. DaSilva joined Virginia Tech's Bradley Department of Electrical and Computer Engineering in 1998, where he is now an Associate Professor. He received his Ph.D. in Electrical Engineering at the University of Kansas and previously worked for IBM for six years. Dr. DaSilva's research focuses on performance and resource management in wireless and mobile ad hoc networks. He is currently researching the application of game theory to model mobile ad hoc networks (MANETs), topology control, cooperation and reputation management in heterogeneous ad hoc networks, energy-aware multicast route discovery, and cognitive networks. Current and recent research sponsors include the National Science Foundation, the Office of Naval Research, DARPA, Booz Allen Hamilton, the U.S. Customs Services, Intel, and Microsoft Research, among others.

He is a member of the Wireless @ Virginia Tech research group. Dr. DaSilva is a Senior Member of IEEE, a member of the ASEE and of ACM, and a past recipient of the ASEE/IEEE Frontiers in Education New Faculty Fellow award. In 2006, he was named a College of Engineering Faculty Fellow at Virginia Tech.