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Performance analysis on spectrum coexistennce between Wi-Fi networks and ground based radar using database assisted spectrum sensing scheme (Conference Paper)

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Abstract

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Cognitive Radio (CR) is an intelligent method for opportunistic access of idle resources and a solution for spectrum resources scarcity. In this article a new technique for spectrum access is proposed. This technique combines spectrum sensing with geolocation database. The proposed technique is employed in radar bands of (960-1400 MHz, 2.7-3.6 GHz and 5-5.85 GHz). These bands occupy quite large bandwidth and they are utilized only about 5% of the time. The new proposed technique is expected to solve the problem of hidden receivers faced by spectrum sensing. It also poses a solution for the static nature of geolocation database method. It minimizes the interference caused by secondary users by improving the probability of detection. Furthermore, this technique takes advantage of the tempral spectrum opportunities resulting from Radar rotation. In this article, primary systems protection distance and resultant secondary Wi-Fi network is analyzed. It is found that when blind sensing without any information about Radar rotation and Antenna pattern is employed the primary protection distance is very large, also the Wi-Fi network can achieve required throughput only when it is located beyond the protection region. On the other hand, when information about Radar rotation and Antenna pattern is provided through database, the secondary devices can coexist with Radar and the protection distance will minimal as the Wi-Fi network is alloed to operate on the same band when the Radar main Beam is not directed at it. © 2016 IEEE.

Author keywords

Cognitive radio | Geolocation Database | Radar | Spectrum sensing | Wi-Fi

Indexed keywords

Engineering controlled terms: Database systems | Directional patterns (antenna) | Radar | Radar antennas | Systems engineering | Tracking (position) | Wi-Fi | Wireless local area networks (WLAN)

Compendex keywords: Geo-location database | Ground based radar | Hidden receivers | Intelligent method | Opportunistic access | Performance analysis | Probability of detection | Spectrum sensing

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