A TDMA-based cooperative MAC protocol for cognitive networks with opportunistic energy harvesting

ABSTRACT

In this article, a cooperative medium access control (MAC) protocol called cooperative cognitive TDMA (CC-TDMA) for cognitive networks is proposed, which is based on time division multiple access (TDMA). The proposed protocol guarantees the quality of service (QoS) required by the primary network. In this regard, licensed users lease part of their spectrum to unlicensed users to retransmit the failed packets on the licensed users' behalf. By doing so, the unlicensed users obtain greater opportunity for data transmission, thus increasing their performance. The simulation and analytical results indicate that the CC-TDMA significantly improves the throughput and packet drop rate (PDR) of both licensed and unlicensed users compared to conventional TDMA.