

Abstract

In this paper, we consider the cognitive network (CR) that can provide a means for offering quality of service (QoS) required by real time services, streaming multimedia and other applications. We consider the approach where the licensed users (primary users, PUs) rent the surplus spectrum to unlicensed users (secondary users, SUs) to get some reward. However, when PU leases more spectrum to the SUs, its quality of service (QoS) is degraded due to a reduction of spectrum. This complex contradicting requirement is embedded in our reinforcement learning (RL) model that is developed and implemented as shown in this paper. Available spectrum is managed by the PU which executes control policy to provide end-to-end QoS connection to the SUs as well as maximizing its revenues. Maximizing profit is a key objective for the PU. In this work, we propose a novel resource management approach in the radio environment. RL is used as a means for extracting an optimal policy that helps a PU to adapt to the changing radio environment conditions, so that the PU profit is maximized continuously over time. The approach integrates different requirements such as rewards for PUs, and the cost of spectrum. Performance evaluation of the proposed spectrum sharing approach shows that the approach is effective at attaining maximized revenue under varying network conditions