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Adaptive spectrum decision framework for heterogeneous dynamic spectrum access networks

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Abstract

Spectrum decision is the ability of a cognitive radio (CR) system to select the best available spectrum band to satisfy dynamic spectrum access network (DSAN) users¿ quality of service (QoS) requirements without causing harmful interference to primary users. In order to have reliable spectrum decision, CR nodes or secondary users (SUs) should identify available spectrum bands and from these candidate spectrum, a SU can select channels which are suitable to meet user QoS requirements. This paper proposes an adaptive spectrum decision framework (ASDF) which is a channel allocation scheme that selects suitable channels from a list of available channels based on SU preferred options. The scheme relies on a geo-location spectrum database for identification of available chanels. Key parameters (i.e. available channel bandwidth, time, and power) are extracted from each available spectrum and tagged according to their level in order to build a matrix of available channels. Our ASDF then maps channels with SUs based on channel properties and SU preferred options. Simulation results show that our ASDF is reliable and consistent when it comes to channel selection. Furthermore, our scheme provides efficient bandwidth utilization when compared to the first come first serve channel allocation scheme.