ABSTRACT

SPECTRUM EFFICIENCY IN WIRELESS SYSTEM BASED ON LTE WITH COGNITIVE RADIO USING A PRIORI KNOWLEDGE METHOD

By

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The rapid development of wireless technology led to the availability of existing frequencies, that can not meet the technical requirements of the technology as well as services expectations by users. This imbalance is caused by the limited frequency spectrum as the unrenewable resource. Therefore the use of frequency spectrum should be efficient, one of the spectrum efficiency methods that can be used is the A Priori knowledge.

In this study, A Priori Knowledge method is used to facilitate the use of spectrum. In this method, the connection of Secondary User (SU) to the eNodeB is analysed by using the history of the connection. By using the largest connected history then this method can efficiently manage the spectrum which is empty or occupied by the Primary User.

The history of SU is generated by Hidden Markov Model (HMM). The HMM simulates the movement of a SU and randomize random position, also determine the probability connected to the eNodeB to achieve probability 1. HMM works with scrambles all possibilities that occur which then produce the next state or position. The simulation model composed of 3 SUs and 3 eNodeBs in which the maximum capacity is negligible. Based on the simulation results it can be concluded that the Opportunistic Spectrum Access with A Priori Knowledge is able to efficient the use of spectrum.

Key words : Efficiency spectrum, A Priori Knowledge, Cognitive Radio, Opportunistic Spectrum Access, HMM