

Optimal Network Selection in Cognitive Radio Networks using Multiple Attributes Decision Making Methods

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ABSTRACT:

Currently the growing demand for wireless communication users has generated the study and implementation of Cognitive Radio (CR) networks. It is envisaged that in future Cognitive Radio networks deployment, the multiple radio access networks may coexist. The networks may have different characteristics in terms of multiple attributes. CR will have choices to select the optimal network out of the available networks. The optimal network selection is a challenging task which can be done by spectrum handoff with Multiple Attributes Decision Making (MADM). One important topic of the development of CRNs is spectrum handoff, which ensures the uninterrupted communication of Secondary Users (SUs). The spectrum handoff decision with MADM provides wider and optimum choice with quality of service. This motivates to develop the spectrum handoff scheme with MADM methods such as Simple Additive Weighting (SAW) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) which is the objective of this paper. The CR preferences are based on voice, video and data services, called triple play services. The numerical results show that all MADM methods are effective for selecting the optimal network for spectrum handoff with reduced complexity in spectrum handoff decision. The paper shows that the proposed spectrum handoff scheme can be effectively implemented to select optimal network according to triple play services in CR networks.

Keywords: Cognitive Radio, SAW, TOPSIS