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# Hybrid Algorithm for Frequency Channel Selection in Wi-Fi Networks

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**Abstract :** This article proposes a hybrid algorithm for spectrum allocation in cognitive radio networks based on the algorithms Analytical Hierarchical Process (AHP) and Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) to improve the performance of the spectrum mobility of secondary users in cognitive radio networks. To calculate the level of performance of the proposed algorithm a comparative analysis between the proposed AHP-TOPSIS, Grey Relational Analysis (GRA) and Multiplicative Exponent Weighting (MEW) algorithm is performed. Four evaluation metrics is used. These metrics are the accumulative average of failed handoffs, the accumulative average of handoffs performed, the accumulative average of transmission bandwidth, and the accumulative average of the transmission delay. The results of the comparison show that AHP-TOPSIS Algorithm provides 2.4 times better performance compared to a GRA Algorithm and, 1.5 times better than the MEW Algorithm.

**Keywords :** cognitive radio, decision making, hybrid algorithm, spectrum handoff, wireless networks
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