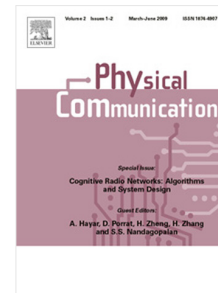


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Transmit Power and Bits/Channel Use Adaption in Competitive Cognitive Radio Networks

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Abstract

In this paper, we propose an optimization framework to determine the distribution of power and bits/channel use to secondary users in a competitive cognitive radio networks. The objectives of the optimization framework are to minimize total transmission power, maximize total bits/channel use and also to maintain quality of service. An upper bound on probability of bit error and lower bound on bits/channel use requirement of secondary users are considered as quality of service. The optimization problem is also constrained by total power budget across channels for a user. Simulating the framework in a centralized manner shows that more transmit power is allocated in a channel with higher noise power and bits/channel use is directly proportional to signal to interference plus noise power ratio. The proposed framework is more capable of supporting high bits/channel use requirement than existing resource allocation framework. We also develop the game theoretic user based distributed approach of the proposed framework. We see that user based distributed solution also follows centralized solution.

Key words: Cognitive Radio, Centralized Solution, Game Theory, User-based

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