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Survey on Optimal Channel Allocation Scheme for Wireless Networks Considering Sensing Error

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Abstract Radio spectrum is one of the most scarce and valuable resources for wireless communications. Cognitive radio has been considered as an efficient means to opportunistic spectrum sharing between primary (licensed) users and cognitive radio users. Spectrum sensing is not always perfect in practical cognitive radio networks. In this paper, two kinds of sensing errors are considered into the channel allocation scheme. Our work focuses on the cases that the channel availability varies fast during a channel allocation period, in which case the channel dynamics needs to be considered. The sensing errors are modelled to derive the metric of mean delay for each user-channel combination using the vacation queuing model. Further, the optimal resource allocation is determined based on the mean delay metric by bi-partite graph matching. The simulation results indicate that the proposed mean delay metric can represent the transmission performance successfully, and the proposed resource allocation scheme is robust to sensing errors.