Abstract

We consider cooperative spectrum sensing in which multiple cognitive radios collaboratively detect the spectrum holes through energy detection and investigate the optimality of cooperative spectrum sensing with an aim to optimize the detection performance in an efficient and implementable way. The optimal voting rule has been derived for any detector applied to cooperative spectrum sensing. Also, detection threshold is optimized when energy detection is employed. Finally, a fast spectrum sensing algorithm for a large network is proposed which requires fewer than the total number of cognitive radios in cooperative spectrum sensing while satisfying a given error bound.

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