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## A modified Otsu's algorithm for improving the performance of the energy detector in cognitive radio (Article)

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## Abstract

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In this paper, we present a modified Otsu's algorithm for solving the automatic threshold estimation problem in energy detection based Cognitive Radio (CR) application. The modified algorithm was tested extensively and compared with other known algorithms using both simulated and real datasets. In particular, our findings reveal that the modified algorithm provides an averagely lower false alarm rate than the other techniques compared with in this paper. Furthermore, the results obtained show that the algorithm is independent of the bandwidth's size, while having a total complexity of O(V), where V is the total sample size. Thus, from the results of this paper, full and effective automatic blind spectrum sensing using an Energy Detector is possible in CR. This can be achieved at a Signal-to-Noise Ratio of 5 dB to meet the IEEE 802.22 draft standard of $P_D$>90% and $P_{FA}$<10%.


## SciVal Topic Prominence

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Adaptive threshold | Autonomous | Cognitive radio | Efficient energy detection | Modified Otsu algorithm | Nonparametric

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