Higher Order Statistical Approach for Performance Evaluation of different Spectrum Sensing Techniques in Cognitive Radio Network

Abstract

Cognitive radio is an intelligent wireless technology that increases the spectrum efficiency for its usage in applications. CR enriches wireless technology by utilizing the spectrum holes in order to provide high order quality service to users and to minimize the interference that can occur in the network. The work that has to be proposed we will uses two Spectrum Sensing techniques for Cognitive radio network which include Cyclostationary detection and Energy detection techniques. In this paper, the parameter used for Cyclostationary signal is Spectral Correlation function(SCF). The detection capability of this (SCF) with different windows is used to check the periodicity of the signal using different-different windows. Due to the periodicity of the baseband signal, SCF would be able to detect the primary user signal at very low SNR. We also analyzed in our proposed work that capability of periodicity of the signal of SCF is not only limited to noise affected signal, it also able to detect the attenuated signal. We have also simulated Energy detection over MIMO fading channel as it models both Rician fading channel and Rayleigh fading channel. The performance in terms of Bit error rate by providing low probability of false alarm and high probability of detection is analyzed. The Statistical test based comparison is made between the two sensing techniques to evaluate the performance in terms of signal to noise ratio. In the proposed work An extensive set of simulations have been conducted in MATLAB.
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References


Index Terms

Computer Science

Signal Processing
Keywords
Cognitive radio  Energy Detection  Cyclostationary Detection