Abstract

The Cognitive Radio is a most authentic solution for the spectrum scarcity as there is rapid growth in wireless communication and spectrum is very limited. The main and key function of cognitive radio is to sense the idle spectrum which can be used for by secondary users in opportunistic manner. A number of techniques are proposed by various researchers. Energy Detection (ED) is the most popular technique for spectrum sensing but its performance degrades at low SNR. Spectral Covariance sensing is another effective technique which provides better detection but computationally it is more complex. It also requires higher sensing time than Energy detection. In this paper an improved hybrid spectrum sensing technique is proposed which is based on Energy detection as well as on spectral covariance based detection. Further, the performance analysis of our proposed hybrid spectrum sensing technique is evaluated. The performance is measured in terms of False alarm Probability of detection, SNR and sensing time. It has been observed that for low signal to noise ratio, where the energy detector is not reliable, the hybrid spectrum sensing technique provides improved detection. Results show that the mean detection time of the hybrid spectrum sensing technique
is much lower than the Spectral covariance detection technique for most of the SNR range.

References


Index Terms

Computer Science Wireless

Keywords

Spectrum Scarcity, Spectrum Sensing, Energy Detection (ED, Spectral Covariance (SC), Hybrid
Spectrum Sensing, Detection Performance, Sensing Time.