ABSTRACT

One of the major components of cognitive radio is its ability to detect the availability of unused spectrum. In a cognitive radio, it is necessary to guarantee the quality of the spectrum detection about the presence or absence of the spectrum hole before the frequency spectrum is used. Previous research in the field of spectrum detection for cognitive radio in the paper titled Collaborative Spectrum Sensing in Cognitive Radio Using Hard Decision Combining with Quality Information explain about the signal detected by the distributed detection using energy detector method and its application has not been used for OFDM (Orthogonal Frequency Division Multiplexing) signal. A new method of signal detection was introduced in the paper titled Autocorrelation-Based Decentralized Sequential Detection of OFDM Signals in Cognitive Radios. This paper introduces a simple and computationally efficient spectrum sensing method for detection of OFDM signal using autocorrelation coefficients of OFDM signal.

In this thesis, the author will examine the spectrum detection method for OFDM cognitive radio with distributed detection using autocorrelation-based detector method with 2-bit decision information. This study will propose a model and design of the threshold in each cognitive radio user to generate optimum fusion rule based on specific criteria in the fusion center to increase the probability of detection using the methodology introduced in the papers titled Collaborative Spectrum Sensing in Cognitive Radio Using Hard Decision Combining with Quality Information and Autocorrelation-Based Decentralized Sequential Detection of OFDM Signals in Cognitive Radios.

The results of this study will show that by using an autocorrelation-based detector with 2-bit decision information in spectrum detection for OFDM cognitive radio, the probability of detection will be increased when compared to using an autocorrelation-based detector with 1-bit decision information.