

## ABSTRACT

The development of wireless technology is striving for the sufficient allocation of spectrum frequency as the resource. Basically, the government provides the resource only for official institute but the utilization is not effective and efficient yet. The other emerging issue is about how the spectrum utilization beyond the limit so that interferes the other user of telecommunication channel. To overcome the problem, it has been developing cognitive radio technology with spectrum sensing as the essential component to detect the communication environment from the existence of spectrum frequency and occupied legal user in that spectrum.

In this final project is analyzed about spectrum sensing process in cognitive radio by using discriminant method. The multisine signal is generated in certain condition of SNR and passed by initial detection and segmentation before the application of discriminant method. As a threshold, discriminant line will be applied into several models based on the discriminant divider and every line will be connected by Weighted Least Square (WLS) technique in the next step as the representation of visual boundary between signal and noise of the entire observed spectrum. Validation of the spectrum sensing result is considered by misclassification probability of signal line and noise line that its value must be below 0,5.

The simulation demonstrates that discriminant method is able to separate signal and noise by having a simple start that is amplitude  $A_x(k)$  of the analyzed spectrum. Besides, it is derived that the best spectrum sensing condition is by using discriminant divider = 2 with WLS curve fitting  $\tau = 1$ .

**Keywords:** Cognitive Radio, Spectrum Sensing, Discriminant, Weighted Least Square