

## **ABSTRACT**

Guitar is a popular musical instrument all over the world. We can find so many people playing this instrument. To produce a harmonious and appropriate sound, the strings of the guitar need to be tuned well. But, this is one of a problem, especially for beginner . Because we need a very accurate hearing to say that the note of the strings is tuned or not.

In this Final project, the guitar tuner is designed based on Fast Fourier Transform. This method observe the spectrum of real time guitar sound which connected to the laptop by soundcard and mini jack connector. We will observe the magnitude of the sound spectrum and classify the vicinity of first peak along the spectrum to detect the fundamental frequency of the tone played.

In the design, we get the optimum system with 100% accuracy of tone reading, and 99,4984% accuracy of frequency detection when we used 0.01 treshold and rectangular window. The optimum number of FFT bin's is 131072 with time average 0,05168 seconds

**Keywords :** Guitar, FFT, Frequency, Tuning, Real Time