

## ABSTRACT

Now is a digital era where all information dissemination uses digital media including audio. Audio that is now spread is uploaded and published via the internet. People who are not responsible for piracy to make a profit. For that we need protection. There are various ways in copyright protection one of them is with the insertion of data called watermarking. The data that is ideally inserted is an identity that can prove ownership of the digital data.

In this research the audio watermarking method used is centroid calculation based on Stationary Wavelet Transform (SWT) by adding the synchronization bit and using Quantization Index Modulation (QIM) as the embedding method. The watermarking process is done by adding the synchronization bit to the audio host which is then transformed using Stationary Wavelet Transform (SWT) after it is calculated centroid based on the signal selected from the SWT output then the watermark is inserted using Quantization Index Modulation (QIM) using centroid parameter. The bit synchronization aims to get the location of the first watermark bits inserted. The test was performed on five hosts speech with background music, piano sound, guitar sound, drum sound and bass sound

The results of this research are ODG ranging in values  $-2$ ,  $SNR > 20$  dB and BER 0 for testing without attack. For the average value of BER before optimization is 0.36 whereas after optimization the average value of BER 0.19 with SNR value is between 10 to 30 dB and the ODG value is between  $-3$  to  $-1$  for all hosts. The watermarking system is resistant to several attacks such as resampling, delay, linear speed change, time scale modification for host speech, guitar and drums while for piano and bass host systems less resistant to attack.

**Keywords :** *SWT, Centroid, Synchronization, Watermarking, Audio, QIM*