

## ABSTRACT

Nowadays a variety of data hijacking whether it be voice data , image, or text continues to increase . Hijacking can occur in communication lines or by attacking the victim directly. The use of Internet technologies also affect to the increase in the amount of data hijacking. To improve the security of the data to be sent can be done by hiding the data into a media or other data . A kind of technique to hide messages or data into a different media is called steganography.

In this final project will be carried out simulation and analysis of steganography on text data using Enhanced Least Significant Bit insertion (ELSB). Media used as a place of insertion is audio data has previously been given a three-dimensional effect using the equation in Table Lookup algorithm Architecture (TLA). Final testing of the process is done in a non - real time.

By using the equation on the TLA algorithm can produce a wider sound effects and seemed to be in the back of the head or away from the head. The use ELSB insertion method can generate good SNR which is still above 20dB when the ratio of messege length to host length is 0.003 or 3%. Additionally, ELSB method that has been modified to survive the onslaught of Power Line Noise (PLN) with an amplitude of 0.001 volts to 0.007 volts on experiment using 11 characters long messages. The results of Mean Opinion Score (MOS) for testing the audio quality TLA three-dimensional with maximum scale is 3, shows the total average value of 2.3. While the results for the MOS embedded sound quality with maximum scale is 5 shows the average value of 3.83 when message length to host length ratio (MLHL) is 1%. SNR of the system is still above 20dB when MLHL is 3%., while the largest MSE is  $6.54 \times 10^{-5}$  when MLHL is 4%. The longest computation time is when MLHL is 4% with embedding time is 91.0775 second, and extraction time is 0.493 second.

Keywords: Steganography, *Least Significant Bit*, *Enhanced Least Significant Bit*, PSNR, 3D Audio.