

# AUDIO STEGANOGRAPHY

Submitted by

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# AIM

Design and implement an efficient steganography algorithm that will hide and retrieve a secret text message inside a cover audio file (.wav format).

Any kind of substitution is allowed to hide the secret message within the cover audio. Your objective should be to intelligently select the portions of the audio such that the original voice does not get distorted (or try to minimize the distortion). The quality of the audio after the message embedding will be checked manually by listening to the modified audio. However, the input secret message will vary in length. Thus, the quality degradation will be checked with small as well as large messages. The secret text message will be given by the user during execution. Successful extraction of the message is also needed.

# Introduction

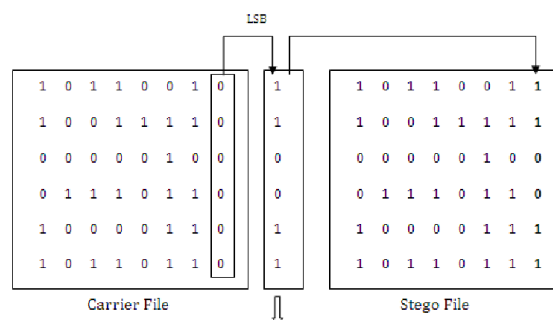
## Audio Steganography

Audio steganography is a method for hiding facts interior an audio signal. Present audio steganography software program can embed message in Wav, Au, and maybe Mp3 sound data. Embedding hidden message in analog sound is generally a more challenging manner then embedding message in different data together with virtual photographs. It is important to get routines that limit access to those sound documents furthermore for its security. Generally information is inserted in audio records with the end goal of copyright insurance or for confirmation of computerized media. In a PC-based audio Steganography framework, hidden messages are set up in automatic sound. In Audio Steganography, the shortcoming of the HAS is utilized to conceal data inside the sound.

## LSB bases Audio Steganography

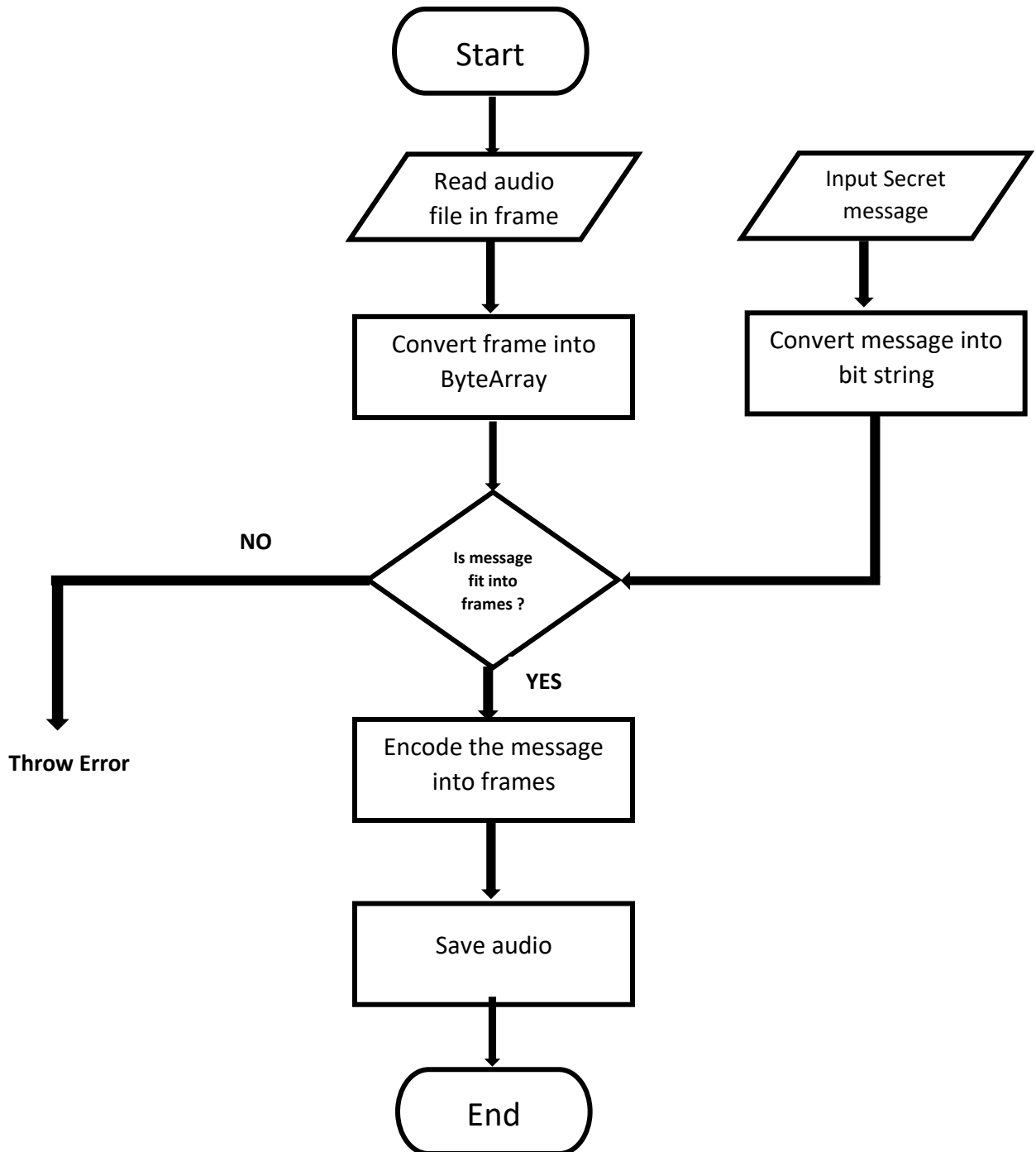
Spatial domain technique is additionally called temporal domain technique and substitution technique. In spatial area strategy, the concealed information is shrouded specifically into host record in which the steganography method is basic and simple to implement.

LSB hiding is an easy and quick procedure for inserting data in a sound sign. In LSB approach LSB of binary series of every illustration of digital audio data is interchanged with binary equivalent of secret data. As shown in below diagram :

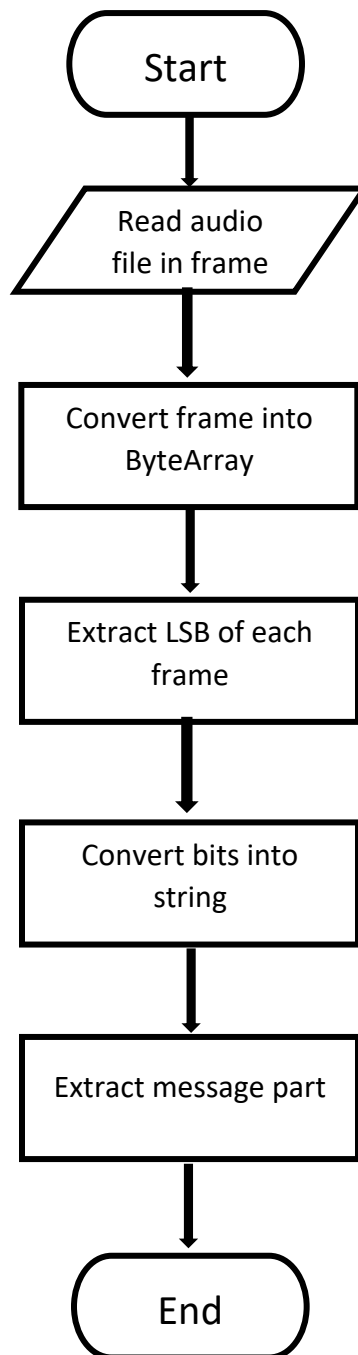


# Flow Chart

## ➤ Encode



## ➤ Decode



# Algorithm

## ➤ Encoding

1. Start.
2. Input cover audio and secret message.
3. Extract frames from audio in the form of bytearray.
4. Convert input message into binary format.
5. If (length\_of\_input\_binaryMessage > length\_of\_frame):
  - a. Throw error
6. Initialize data\_index to 0.
7. For l in range( length\_of\_frame ):
  - a. If ( frame\_byte[i] > 100 ):
    - i. If ( data\_index < length\_of\_input\_binaryMessage ) :
      1. Initialize LSB to binaryMessage[data\_index]
      2. data\_index = data\_index + 1
    - ii. Else
      1. Break
8. Create/open an new audio.
9. Set all parameter of old audio into new audio.
10. Write modified\_frame into new audio frame.
11. Exit.

## ➤ Decode

1. Start.
2. Input cover audio and secret message.
3. Extract frames from audio in the form of bytearray.
4. Initialize extracted\_bit to empty string
5. For l in range (length\_of\_frame\_byte) :
  - a. If ( frame\_byte[i] > 100 ) :
    - i. Append LSB of frame into extracted\_bit
6. Convert extracted\_bit into string.
7. Extract first part of delimiter
8. Print extracted message
9. Exit.

# Result

## - Encoding and Decoding

Select an option:

1)Encode

2)Decode

3)exit

Choice:1

Please give path of cover audio file : cover\_audio.wav

Enter the Message you want to hide : This is top secret message

Encoding.....

Encoding Successfullty!!!

File saved as : cover\_audio\_stego.wav

Select an option:

1)Encode

2)Decode

3)exit

Choice:2

Please give path of stego audio file : cover\_audio\_stego.wav

Decoding....

Successful !!

Decoded message are : This is top secret message

Select an option:

1)Encode

2)Decode

3)exit

Choice:4

Enter valid Choice!

Select an option:

1)Encode

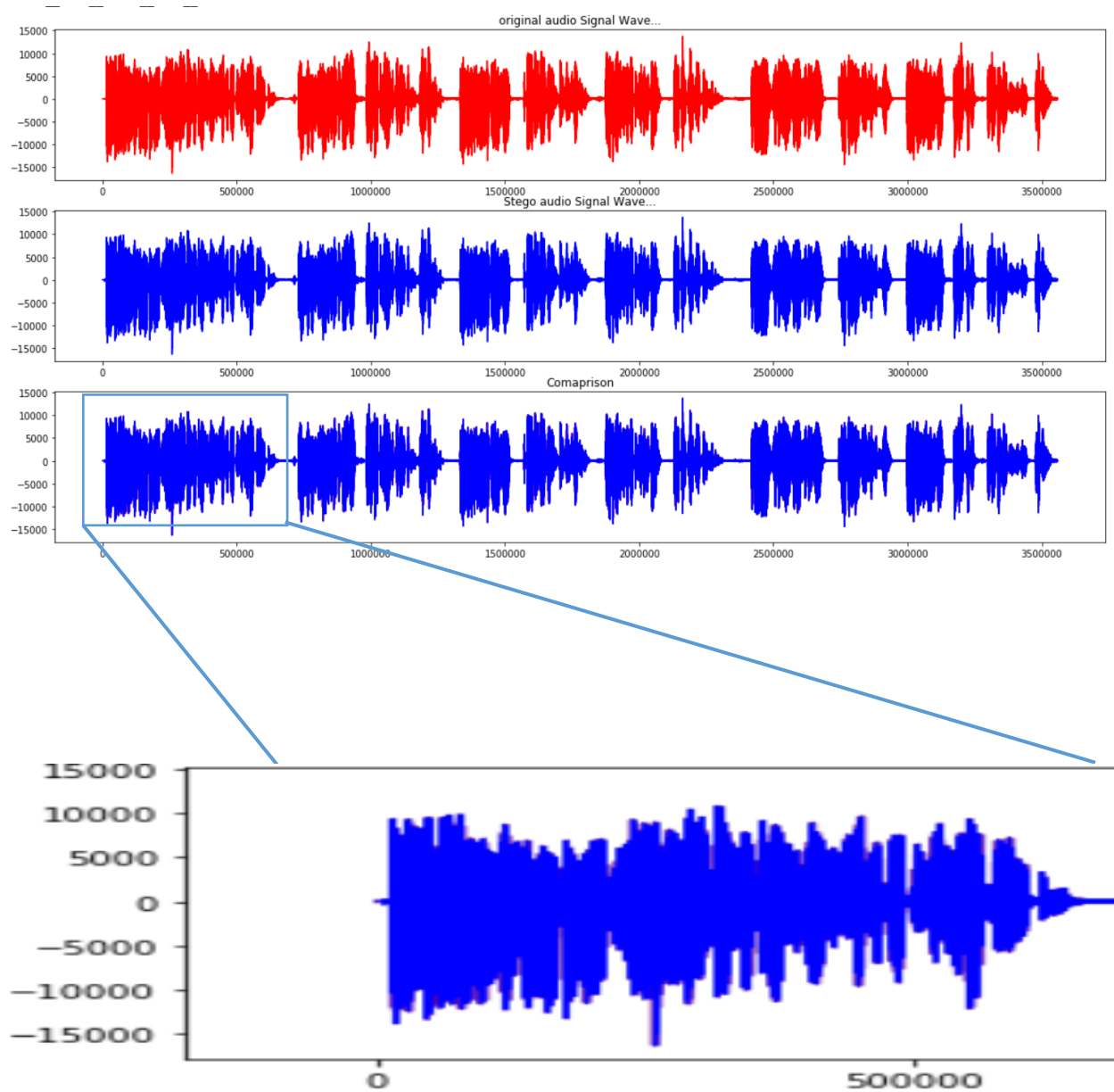
2)Decode

3)exit

Choice:3

- Plots

Below are the plots of the sounds for each frame. The last plot shows the difference between the two sounds.



In the above figure, we can observe some red color in between blue spikes so that is indication of some noise.



# Appendix

- Github link

<https://github.com/voilentKiller0/LSB-Audio-Steganography>

(Kindly import in colab)