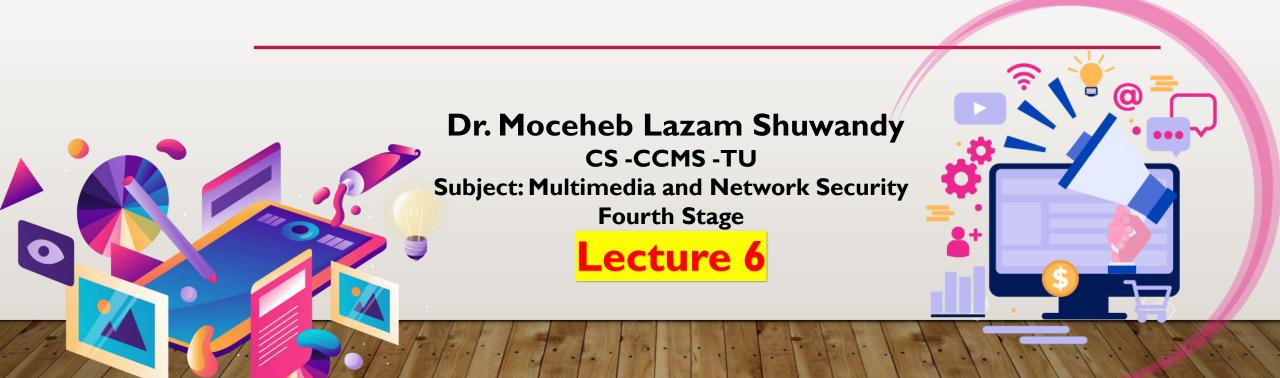
Steganography Using Audio File Part 2



2 SPREAD SPECTRUM

- In the context of audio steganography, the basic spread spectrum (SS) method attempts to spread secret information across the audio signal's frequency spectrum as much as possible.
- This is analogous to a system using an implementation of the LSB coding that randomly spreads the message bits over the entire sound file.
- However, unlike LSB coding, the SS method spreads the secret message over the sound file's frequency spectrum, using a code that is independent of the actual signal.

3 SPREAD SPECTRUM ... CON.

- As a result, the final signal occupies a bandwidth in excess of what is actually required for transmission.
- <u>Two versions of SS</u> can be used in audio steganography: the direct-sequence and frequency-hopping schemes.
- In direct sequence SS, the secret message is spread out by a constant called the chip rate and then modulated with a pseudorandom signal. It is then interleaved with the cover-signal.
- In frequency-hopping SS, the audio file's frequency spectrum is altered so that it hops rapidly between frequencies.

4 SPREAD SPECTRUM ... CON.

- The SS method has the potential to perform better in some areas than LSB coding, parity coding, and phase coding techniques in that it offers a moderate data transmission rate while also maintaining a high level of robustness against removal techniques.
- However, the SS method shares a <u>disadvantage</u> with LSB and parity coding in that it can introduce noise into a sound file.

5 PROPOSED TECHNIQUE

- The algorithm is based on the redundancy of bits in binary code of numbers, lowercase, and uppercase alphabets.
- If we look at the binary code of numbers from 0 to 9, A to O, O to P, a to o, and o to p the last 4 bits are different and the first 4 bits are similar.
- So any number and alphabet can be represented by the last 4 bits and adding either '0' or '1' at the first position.

6 PROPOSED TECHNIQUE ... CON.

- To differentiate whether the character is a number, uppercase alphabet or lowercase alphabet control symbols are used, which are the same type as that of number or alphabet.
- For special symbols like !,", #, \$, %, &, (,,), *, +, ;, -, ., / is also observed and these special symbols can also be embedded in the WAV file.
- When embedding the textual information in any audio file, first the audio signal is converted into bits.
- Then the message to be embedded is converted from the above strategy.
- By applying the LSB algorithm, the message is embedded into 16 bits or 8 bits audio sample.

7 PROPOSED TECHNIQUE ...CON.

- The performance is evaluated by applying the LSB algorithm at different positions i.e. ILSB, 2LSB, and so on.
- At the receiver side, the first five bytes are taken, if these bytes are the same as our control symbols bytes then the next character case is defined.

8 PROPOSED TECHNIQUE ... CON.

Encoding Algorithm and Decoding Algorithm

- Encoding Algorithm
- I. Input the text to be embedded.
- 2. Convert the text into 5-bit code by checking the redundancy in binary code of alphabets and numbers.
- 3. Read the WAV audio file as a cover file.
- 4. Select an audio sample and hide the converted 5-bit code of the text in a WAV file using the LSB algorithm.
- 5. Repeat till the whole message can be embedded in audio.

9 PROPOSED TECHNIQUE ... CON.

Encoding Algorithm and Decoding Algorithm

- <u>Decoding Algorithm</u>
- I. Read the stego-object i.e. cover audio after encoding.
- 2. Extract the message by reading the control symbols in samples and reading LSB. Input the text to be embedded.
- 3. Select all samples and store all LSB position bits in an array.
- 4. Divide the array into a number of rows and columns
- 5. Display the secret message.

ThankYou