CHAPTER 1

INTRODUCTION

1.1 GENERAL

Digital/Audio Watermarking is the intriguing field of research that is in the growth phase. As mentioned earlier in this report, all the services have switched to online mode which makes it essential to maintain the confidentiality and security of a large dataset. Our objective in conducting the literature survey was to identify the gaps in previous research and try to bridge them through our project proposal.

In order to accomplish our goal we have referred to six literature papers and reviewed them to gain insights and draw inferences to proceed with our research. Having leveraged the gap between the problem and the proposed solutions related to Audio Watermarking of Audio signals, we performed experiments to determine which method of encrypting the signals was reliable and efficient.

In order to carry out the execution, we used the Audacity, an open source software platform to watermark the host file- “The Adventures of Sherlock Holmes” and thereby generated a white noise using the waveform of Tone (Overlapping method) but a major disadvantage of using the waveform signal of Tone was a noise that was detected and therefore made the quality of host file (original audio) bad due to this the original content could not be recognized.

Encrypting data though necessary is a challenge and according to the reports there are five reasons why encryptions doesn’t work. The reasons are listed below.

1. Encryptions don't work for systems.
2. Encryptions cannot be audited
3. Encryptions does not work against the insider threat

Therefore the experiment performed by us was using a digital image (png or jpeg) to watermark the audio signals which became successful. To carry out this a MATLAB software was used and with the help of coding we accomplished our goal to encrypt the audio signals through digital watermarking. Not only this method is unique compared to other proposed methods by various researchers but also this opens up a way for many to do advanced research in this field.

1.2 NEED FOR DIGITAL WATER WATERMARKING

The pandemic not only has brought destruction to us but also has changed our way of living and working. Since the majority of the population has switched to work from home and this has led to the majority of information being interchanged and transactions taking place online. This does not stop here as the pandemic has also paved the way for digital innovation, from shopping to medical checkups that are taking place through online, it becomes essential to maintain the security and confidentiality of big data therefore Watermarking/encrypting plays a vital role in present and in the future.

With advantages we also have disadvantages of everything switching to an online mode of working. This would augment cyber attacks like phishing, malware, cross site scripting, sql injection and so on. In order to reduce the disadvantages and protect the data watermarking becomes mandatory.

Digital Watermarking is the method of using a digital form of media to hide valale information inside another media to enhance its security.

One of the features of watermarking is that it does not affect the data usage. Furthermore this technology often protects copyright of multimedia data and protects databases and text files from unauthorized access and being corroded.

One of the applications of Watermarking that explains it best and stresses its importance is its use in money and stamps to to assist in identifying counterfeiting. This technique has its similarities to steganography. Hence basically the idea behind creating a watermark is to create a translucent image on the paper to provide authenticity.

In this era of digitization and digitalization it is very difficult to claim 99.999% protection of data after embedding a watermark in the media since there are chances of web scraping, cropping, editing and redistributing but this does not claim the inefficiency of watermarking rather to be on the safer side it is recommended to create a copy of the data with watermark embedded in it. The ideal watermark is 30-70% transparent and covers a significant portion of the asset.

Hence adding a digital watermark is basically adding bits of pattern which are unnoticeable to the human eye in the picture/ video that is to be protected and authenticated. Furthermore since the watermarks are easy to create, applicable in seconds, it is considered to be one of the most effective methods of safeguarding images from theft and unauthorized use.

Therefore these are the reasons why Watermarking is the need of the hour and why one should go for watermarking the data.

1.3 PRINCIPLE OF DIGITAL WATERMARKING

A Watermark is embedded into the digital signal at each point of distribution which is unnoticeable to the human eye. If the data is copied the watermark is carried with the data and the watermark can be retrieved from the copy and the source of distribution is known.

Digital Watermarking is a technology that encrypts information that is readable by machine to another form of media. It is governed by certain algorithms that are used to achieve that state in the most optimized manner possible.

In other words the watermarking is a practice of modifying the digital data(software program, photos, songs, videos) without causing destruction to it to embed a message about that work.

Multimedia watermarking is another such practice where the goal is to make the encryption imperceptible. The watermarking is a technique related to steganography which means to hide the existence of messages in media.

There are two types of digital watermarking- visible and invisible. The visible watermark is similar to the corporation logo displayed at its letterhead but the invisible one that is embedded in the media is unnoticeable and undetectable to the human eye.

There are some six types of watermarks- visible, non-visible, private, public, perceptual and bit stream.

In other words the watermarking is a practice of modifying the digital data(software program, photos, songs, videos) without causing destruction to it to embed a message about that work. Multimedia watermarking is the practice of imperceptibly altering a work. The watermarking is a technique related to steganography which means keeping the existence of messages secret by hiding them within objects, media, or other messages.

1.4 MAJOR ISSUES IN CURRENT ENCRYPTION

Encrypting data though necessary is a challenge and according to the reports there are five reasons why encryptions doesn’t work. The reasons are listed below.

4. Encryptions don't work for systems.
5. Encryptions cannot be audited
6. Encryption does not work against threats made from the inside.
7. Data Integrity is often the biggest question in encryption
8. Most can’t prove whether encryption in place is performing to their needs.

These are the gaps present with encrypting media and through our research we are trying to reduce these gaps to minimal.