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A Review of Digital Watermarking

D.G.Rindhe[1], Dr.G.S.Sable[2]

[1]Student, M.E. Electronics, SPWEC Aurangabad

[2]Department of Electronics, SPWEC,Aurangabad

ABSTRACT

In the present position of global network of Internet, we want to save our digital data i.e. audios, videos, pictures, texts and so on. For this reason we need a security system.Digital watermarking is a promising solution for content copyright protection in the global network. It imposes extra robustness on embedded information. Digital watermarking is the science of embedding copyright information in the original files. The information embedded is called watermarks. Digital watermarking doesn't leave a noticeable mark on the content and don't affect its appreciation. These are imperceptible and detected only by proper authorities. Digital watermarks are difficult to remove without noticeable degrading the content and are covert means in situations where cryptography fails to provide robustness. The content is watermarked by converting copyright information into random digital noise using special algorithm that is perceptible only to the creator. Watermarks are resistant to filtering and stay with the content as long as the original has not been purposely damaged.

1. INTRODUCTION

Now a days, the majority of the information that involvessound, image and video is stored in digital form. Multimedia in digital form offers many advantages and new potentials to the average user.we want to save our digital data i.e. audios, videos, pictures, textsand so on. For this reason we need a security system. In the field of security system for securing the data on Internet there are many systems. But in the present paper we discussed about the security or protection of these data by using digital watermarking.The large use of networked multimedia system has created the needof "Copyright Protection"for different digital medium as images,audio clips,videos etc.The term "Copyright Protection" involves the authentication of ownership and identification of illegal copies of digital media.Though digital media provides various efficient facilities like distributionreproduction andmanipulation of images,audio clips and videos,they increases illegal copyingof digital media. The solution for this problem is to add the visible or invisible structure to digital media which is to be protected from copyright. These structures are known as "Digital Watermarks" and the process of adding digital watermarks to digital media is known as "Digital Watermarking".[3] Digital watermarking is created by inserting a digital signal or pattern into digital content. Digital watermarking is nothing but process of conveying information by imperceptibly embedding it into digital media.The purpose of embedding the information depends upon application and need of user of digital media. Digital watermarking provides the solution for difficult problem of providing guarantee to organizer and consumer of digital content about their legal rights.Copyright protection for multimedia information is nothing but a golden key for multimedia industry.Digital watermarking is a technology that opens a new door for authors,producers,publishers and service providers for protection of their rights and interest in multimedia documents. Digital watermarking is the process of encoding hidden copyright information in an image by making small modifications in it's pixel content.In this case watermarking doesn't restrict the accessing image information. The important function of watermarking is to remain present in data for proof of ownership.The use of digital watermarking is not restricted upto copyright protection.Digital watermarking can also be used for owner identification to identifycontent of owner,fingerprinting to identify buyer of content,broadcast monitoring and authentication to determine whether the data is changed from it's original form or not.

2. PROPERTIES OF DIGITAL WATERMARKING:

2.1 Robustness

The watermark should be robust such that it must be difficult to remove.The watermark should be robust to different attacks.The robustness describes whether watermark can be reliably detected after performing some media operations.

2.2 Perceptual transparency

This property describes that whether watermark is visible or invisible to human sensor organ.Perceptible watermarks are visible to human while imperceptible are not.Imperceptible watermarks are such that content remains same after applying digital watermarking technique.

2.3 Security

Security property describes that how easy to remove a watermark.This is generally reffered to as "attack" on watermarking.Attack refersto detection or modification of watermark.

2.4Complexity

This is important property which is to be consider in real time applications like video.Complexity property is concerned with amountof effort needed to extract or retrieve the watermark from content.

2.5Capacity

Capacity property of digital watermarks refers to amount of information that can be embedded within the content.The important point is that more data is used in watermark,watermark will become less robust.

3. TYPES OF DIGITAL WATERMARKING:

3.1 Perceptible watermarks and imperceptible watermarks

Perceptible watermarks are visible to human eye while imperceptible watermarks are invisible.The perceptible watermarks are useful for primary application i.e. for statement ownership or authorship.So for this reason it should be visible. .On the other hand imperceptible watermarks are useful for complex applications such as document identification in which content being watermarked must appear in unchanged form Examples of visible(perceptible) watermarks are logos on TV,IBM's watermark and that of invisible(imperceptible) watermarks are ATT,NEC/MIT,UU etc. Perceptible watermarks i.e. visible one are extension of the concept of logos.They are applicable to images only.These watermarks are embedded into image.They are applicable in maps,graphics and software user interface. Imperceptible watermarks i.e.invisible one remains hidden in the content. They can be detected only by authorized agency.These watermarks are useful for content or author authentication and for detecting unauthorized copier.

3.2Robust watermarks and fragile watermarks

Robust or fragile is nothing but degree to which watermarks can withstand any modifications of any types caused due to the transmission or loss,compression.Perceptible watermarks are more robust in nature than imperceptible one.But meaning of this is not that imperceptible watermarks are fragile one.Robust watermarks are those watermarks which are difficult to remove from the object in which they are embedded.Fragile watermarks are those watermarks which can be easily destroyed by any attempt to tamper with them.Fragile watermarks are destroyed by data manipulation.

3.3 Private watermarks and public watermarks

Private watermarks requires at least original data to recover watermark information Public watermarks requires neither original data nor embedded watermarks to recover watermark information.Private watermarks are also known as secure watermarks.To read or retrieve private watermark,it is necessary to have secret key.Public watermark can be read or retrieve by anyone using specialized algorithm.In this sense public watermarks are not secure.Public watermarks are useful for carrying PR information.They are good alternatives to labels.

4. APPLICATIONS:

4.1 Broadcast monitoring

This application identifies that when and where works are broadcast by recognizing watermarks embedded in these works.There are variety of technologies to monitor playback of sound recording on broadcast.The digital watermarking is alternative to these technologies due to it's reliable automated detection.A single PC based monitoring station can continuously monitor to 16 channels over 24 hours with no human interaction.Resulted monitoring is assembled at central server and is now available to interested one.[6]The system can distinguish between identical versions of songs,which are watermarked for different distribution channel.Such system requires Monitoring infrastructure and watermarks to be present in content.Watermarking video or music is planned by all major entertainment companies possessing closed networks.

4.2 Encoding

According to the thinking of major music companies and major video studios encoding happens at mastering level of sound recording.In such downstream, transactional watermarks are also considered.Each song is assigned with unique ID from the identifier database.After completion of all mastering processes,ID is encoded in sound recording.To

enhance encoding of audio or video recordings requiring special processing,the human-assisted watermark key is available.[6]

4.3 Copy and playback control

The data carried out by watermark may contain information about copy and display permissions.We can add a secure module into copy or playback equipment to automatically extract the permission information and block further processing if required.This approach is being taken in Digital Video Disc(DVD).

4.4 Content authentication

The content authentication is nothing but embedding the signal information in Content.This signature then can be checked to verify that it has not been alter.By watermarks,digital signatures can be embedded into the work and any modification to the work can be detected.

5. CONCLUSION:

The large need of networked multimedia system has created the need of "COPYRIGHT PROTECTION"It is very important to protect intellectual properties of digital media.Internet playing an important role of digital data transfer.Digital watermarking is the great solution of the problem of how to protect copyright. Digital watermarking is the solution for the protection of legal rights of digital content owner and customer.

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AUTHOR

Dipali G. Rindhe received the B.E degree in Electronics&Tele Communication Engineering from the RajarshiShahu Collage of Engineering Amravati University in 2012,and She is currently pursing the M.E. degree in Electronics Engineering at SavitribaiPhuleWomens Engineering College,Aurangabad