

Review on Text Document Watermarking

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Abstract:- Digital watermarking is the concept of hiding digital signal into digital document such that it cannot be detected and removed easily. That digital signal is called watermark. Text document watermarking is the process of hiding digital data into text document such that it preserves ownership of document. This paper focuses on watermarking process and various techniques including their benefits and limitations.

Index Terms:- DWTC, Text Document, Watermarking.

I. INTRODUCTION

In today's world internet become immense area for sharing data, accessing information, transmission of data from one part of the world to another. On the internet different type of data is available like text, image, audio, video and so on. Now a day's much educational organization, banking sectors, industries uses internet for their working and transactions. So they have to protect the data from outside world for illegal accessing of information. Protect data from illegal authorities there are various method in digital world like cryptography, steganography, watermarking. In steganography main concept is encryption and decryption of data. In case of encryption data is encrypted and outside world or third parties cannot access it. Then on receiver side after decrypting there is no any provision to protect data from replications. So that there is some other technique is needed in order to prove and give the ownership of data, avoid illegal access to that data, protect it from copying and provide certain type of authentications [1]. The technique came in mind after focusing on above problems is that digital watermarking. The basic idea of digital watermarking is to embed digital information in to digital data such that it cannot be easily detected and removed. The digital information as well as digital data may be text, image, audio, video or combination of anything [2]. There are two main types of digital watermarking visible watermarking and invisible watermarking.

1. In visible watermarking the information that is to be embedding in digital data is visible after embedding it in to digital data



Fig1: Image inserting Water-mark as "your name"

2. In invisible watermarking the information that is to be embedding in digital data it cannot be seen by normal human eye after embedding it in to digital data.



Fig2: Image inserting Water-mark

Watermarking Processes: The process of watermarking involves 4 steps [3].

1. Watermark Generation
2. Watermark Insertion
3. Watermark Detection
4. Watermark Extraction

1. Watermark Generation: In this process there are two possibilities one is direct some unique digital signal as watermark is inserted and another is unique watermark is generated using certain technique.

2. Watermark Insertion: As watermark is generated it is inserted in original digital signal by some insertion process at certain position.

3. Watermark Detection: In this process user over the internet, third parties, illegal authorities, attacker etc just identify or detect that digital document contains watermark or not.

4. Watermark Extraction: This process is performed at recipient side it extract watermark from digital document by using reverse process of inserting watermark.

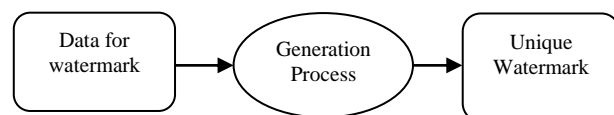


Fig3: Generation Process

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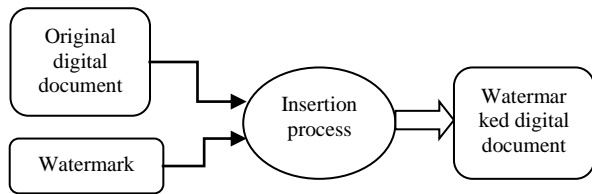


Fig4: Insertion Process

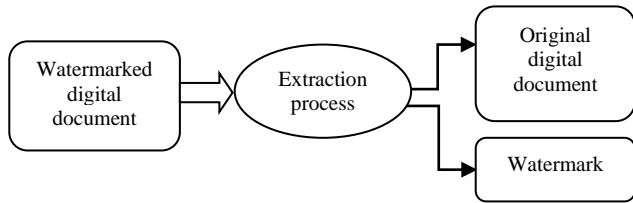


Fig5: Extraction Process

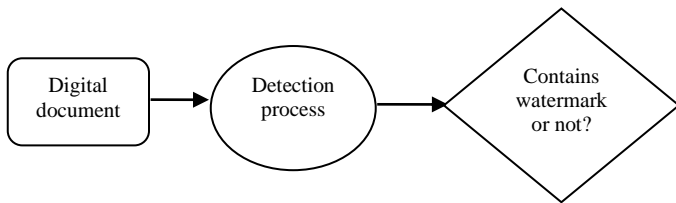


Fig6: Detection Process

History

The history of watermark dates back to 13th century. Then Watermarking technique introduced in china and used for paper watermarking. The watermarking was composed by embedding thin metal sting or strip patterns to the paper mold. The paper becomes thinner at place where string or strip was inserted. The objectives for doing this are that they may have been used for identifying the molds or trademarks to identify paper maker.

Importance of Text: Text is easy, less expensive, faster, and effortless medium of communications over the internet as compare to other multimedia. There are various text document enlisted as research paper, secrete text message, emails, bills, biddings, thesis, agreements, confirmations, responses, banking, digital libraries, web, journals, magazines, confidential messages, military messages, etc.

As it has secure message so there is possibility of breaking that security by attacker, hacker and illegal users. So by keeping this thing in mind there are certain techniques used for security of text document like steganography, cryptography, and watermarking.

Text document watermarking: The process of inserting digital watermark into text document which posses unique information about document owner. Due to text document watermarking re-distribution, recopying is prevented and copy detection and copyright protection is achieved.

II. RESEARCH ON TEXT DOCUMENT WATERMARKING

1. Line Shifting: In text document even lines are slightly shifted up or down as a watermark so that normal human eyes

cannot detect the difference. Odd lines are use at the time of decoding as a reference [4].

2. Word Shifting: Each line made by number of words. So that even group of words is shifted left or right as a watermark so that normal human eyes cannot detect the difference. Odd group of words is used as reference to calculate the distance at the time of decoding [4].

3. Feature coding: Feature of any specific character is changed in your document. Then it is detected by comparing with original document and watermarked document [4]. Example shows in below table:

Character in original document	Character in watermarked document
A	A
R	R
J	J
K	K
M	M

4. Technique based on not important content: In text document some of the expression change will not change the meaning of the document, so this is used as watermark. Example: Document contains “text, image, audio and video.” So in watermarked document it becomes “text, image, audio, and video.” [5].

5. Synonyms or acronyms based: In original text document specific words selected then it is replaced by its synonyms or acronyms such that meaning of that document should be same. Then resultant document is watermarked one. Example: in original text document contains “This is big city” replace in watermarked document by “This is mega city” or “This is not a small city” [6].

6. Font size and font coding: In font size coding character font size is increased by 0.5 in watermarked document otherwise keep document as it is. In font coding, Microsoft word has many types of fonts some of them are same means its effect is not identified easily. Such fonts are used as watermarking. Example: “Arial” and “Tunga” [7].

7. Key based: It uses object based environment in which each text string is referred as different object. Each object has its own properties and attributes. So watermark is generated using key and embedded based on properties of object like z-ordering of text object [8].

8. Syntactic approach: Normally text document composed of characters, words, sentences. A sentence has different syntactic structure. In order to insert watermark, apply syntactic transformations on text document [1].

9. Semantic approach: Text constitutes verbs, nouns, objectives, prepositions, word spelling, synonyms, acronyms, sentence structure, and grammar rules and so on. Such semantics are used to insert watermark [1].
10. DWTC: This technique based on web documents. Watermark embedded into web document and by using this technique invisiblens and robustness improved [9].

III. PROPOSED WORK

Above mention techniques some are non robust but faster and easier while some are robust but slow and complex, no any technique is ideal one for watermarking. Following are the technique can be proposed:

1. The proposed work can be one image based technique which shifts the paragraph slightly so the security increases as compare to word or line shifting.
2. The proposed work can be technique in which it can perform dual watermarking on document based on the page number means in that document two watermarks are inserted in first two even pages only.
3. As above two techniques involves one or two watermarks still it is not more secure. In order to increase the security inserted multiple watermarks i.e. more than two based on the size of the document in which total size of document is divided in to some equal parts then in each part one watermark is inserted by applying certain conditions.
4. The proposed work can be technique which involves cryptography of watermark as well as invisiblens of watermark.

All mention techniques increase the watermarked document's robustness, security, watermark capacity, and tamperproof performance.

IV. CONCLUSION

This paper includes the concept of digital watermarking and text watermarking. It gives introductory information of different techniques for text document watermarking. Review on various techniques and its benefits and limitations. Above mention techniques are performs single watermarking expect DWTC is for dual watermarking which give high invisiblens and tamperproof performance. The coding technique in DWTC is can be improved more to increase its performance. This paper also includes the various proposed techniques which can improve the watermarking techniques for more security, robustness, tamperproof performance and so on.

REFERENCES

- [1]Zunera Jalil and Anwar M. Mirza, "A Review of Digital Watermarking Techniques for Text Documents", IEEE International Conference on Information and Multimedia Technology, pp. 230-234, 2009.
- [2]Yanqun Zhang, "Digital Watermarking Technology: A Review", IEEE International Conference on Future Computer and Communication, 2009.
- [3]L.Robert and T. Shanmugapriya, "A Study On Digital Watermarking Techniques", International Journal of Recent Trends in Engineering, Vol. 1, No. 2, pp. 223-225, May 2009.
- [4]Huijuan Yang, Alex, and C. Kot, "Text Document Authentication by Integrating Inter Character and Word Spaces Watermarking", IEEE Inter-national Conference on Multimedia and Expo., Vol. 2, pp. 955 – 958, June 26-30, 2004.

- [5]Zhichao Yu and Xiaojun liu, "A New Digital Watermarking Scheme Based on Text", IEEE Inter-national Conference on Multimedia Information Networking and Security, Vol. 2, pp. 138-140, 2004.
- [6]Nighat Mir and Sayed Afaq Hussain, "Web Page Watermarking: XML files using Synonyms and Acronyms", World Academy of Science, Engineering and Technology, Issue 49, Jan 2011.
- [7]He Lu, Fang Ding Yi, Gui Xiao Lin, Chen Xiao Jiang , Xu Xin Bai, and Liu Jin "A New Chinese Text Digital Watermarking for Copyright Protecting Word Document", Vol. 3, pp. 435-439, 2009.
- [8]Mussarat Abdullah, Quaid Avenue and Fazal Wahab, "Key Based Text Watermarking of E-Text Documents in an Object Based Environment Using Z-Axis for Watermark Embedding", World Academy of Science, Engineering and Technology 2008 , BAHRIA University Islamabad campus.
- [9]Zhang, "DWTC: A Dual Watermarking Scheme Based on Threshold Cryptography for Web Document", International Conference on Computer Application and System Modeling (ICCASM) ,Vol. 8, pp. v8 510 – v8 514, 2010.