A Mechanism for Copyrighted Video Copy Detection and Identification

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Abstract: Rapid development in the field of multimedia technology has made easier to store and access large amount of multimedia data. There are lots of easy editing and publishing mechanism available which makes duplication of multimedia data feature very easy which can cause the violation of digital rights. So, copy rights security becomes a critical problem for the multimedia data over the cloud. This has led to the requiring multimedia copy protection and detection in a large range of the multimedia applications to find illegally-made duplicated copyrighted multimedia copies over the Internet. Watermarking technique was used for same purpose. Using this technique some distortion like Fourier transformation is added in multimedia copy and to play or view the multimedia object in original form this distortion need to be removed by some softwares or players, which makes dependent on those players. However Content based copy detection (CBCD) technique is independent of any software based dependency and identifies copyrighted materials from its content itself. In this technique signatures are created from content itself using SIFT. Content owners specify multimedia objects that they want to protect. Then, system creates signatures from that file and inserts them in the distributed index. The Crawl component once a day downloads recent objects from online hosting sites. The signatures for a query object are created. After downloading of all objects and the signatures are created, the signatures are matched with all indexed signature. If signature matches then this will trap the site which duplicates copyrighted copy without rights. This is effective mechanism, but to fasten this process we have used Audio video cryptosteganography which adds secrete information in multimedia object itself which can neither be removed nor can be identified visually as watermarks are visible. This secrete information is considered as copyrighted information before forming the digital signature. If this secrete information matches with secrete information from database then all contents in the multimedia will be cross verified using CBCD and in this way copyrighted material will be identified.

Keywords: CBCD-Content based copy detection, cryptosteganography, multimedia objects, SIFT

1. Introduction

Rapid development in the field of multimedia technology has made easier to store and access large amount of multimedia data. There are lots of easy editing and publishing mechanism available which makes duplication of multimedia data feature very easy which can cause the violation of digital rights. So, copy rights security becomes a critical problem for the multimedia data over the cloud. This has led to the requiring multimedia copy protection and detection in a large range of the multimedia applications to find illegally-made duplicated copyrighted multimedia copies over the Internet.

Duplication of copyrighted materials makes huge loss to content owners. Consider an example where a party creates a video and sales its copyrights to a hosting party say YouTube which pays for it per view of the video on YouTube to content owner. But if that copyrighted material is leaked and hosted on some different hosting site then it will make loss to Content owner as well as YouTube. So this copyrighted stealing need to be caught. But how ?

2. Proposed Methodology

Watermarking technique was used for same purpose. Using this technique some distortion like Fourier transformation is added in multimedia copy and to play or view the multimedia object in original form this distortion need to be removed by some softwares or players, which makes dependent on those players.

We propose a new design that achieves rapid deployment of content protection systems, because it is based on cloud infrastructures that can quickly provide computing hardware and software resources. Along with CBCD mechanism we will use cryptosteganography mechanism to hide secrete copyright information in multimedia object to fasten the copyright detection mechanism. The design is cost effective because it uses the computing resources on demand. The design can be scaled up and down to support varying amounts of multimedia content being protected. The proposed system is fairly complex with multiple components, including:

1) Crawler to download thousands of multimedia objects from online hosting sites,
2) Signature method to create representative fingerprints from multimedia objects,
3) Reference registration where secrete information is inserted in multimedia copy using cryptosteganography
4) Distributed matching engine to store signatures of original objects and match them against query objects.

CBCD – Content Based Copy Detection

Content based copy detection (CBCD) technique is independent of any software based dependency and identifies copyrighted materials from its content itself. In this technique signatures are created from content itself using SIFT. Content owners specify multimedia objects that they want to protect. Then, system creates signatures from that file and inserts them in the distributed index. The Crawl component once a day downloads recent objects from online hosting sites. The signatures for a query object are created. After downloading of all objects and the signatures are
created, the signatures are matched with all indexed signature. If signature matches then this will trap the site which duplicates copyrighted copy without rights.

3. Conclusion

In this paper, we presented a content based copy detection system. The system is based on inserting digital signatures using Audio video cryptosteganography which adds secrete information in multimedia object itself as a copyright information in the media itself and authorizing it so that it can be used to fasten the content based copy detection method. This mechanism will help to detect copyrighted multimedia stealing and will help to stop loss to content owner due to illegally duplicating copyrighted material.

References