

A Study on Illegality Judgment System for Cloud-based Streaming Videos and Webtoons Using Signature DB

Byoengchan Park

Department of Computer Science and
Engineering, Soongsil University
369, Sangdo-ro, Dongjak-gu, Seoul
Korea
pbc866@gmail.com

Youngsun Kwon

Department of Computer Science and
Engineering, Soongsil University
369, Sangdo-ro, Dongjak-gu, Seoul
Korea
dolphini0727@naver.com

Seyoung Jang

Department of Computer Science and
Engineering, Soongsil University
369, Sangdo-ro, Dongjak-gu, Seoul
Korea
seyjang216@soongsil.ac.kr

In-Jae Yoo

Beyondtech Inc.
165, Gasan digital 1-ro, Geumcheon-
gu, Seoul
Korea
halo8024@beyondtech.co.kr

Jeacheng Lee

Beyondtech Inc.
165, Gasan digital 1-ro, Geumcheon-
gu, Seoul
Korea
halo8024@beyondtech.co.kr

Seok-Yoon Kim

Department of Computer Science and
Engineering, Soongsil University
369, Sangdo-ro, Dongjak-gu, Seoul
Korea
ksy@ssu.ac.kr

Youngmo Kim

Department of Computer Science and
Engineering, Soongsil University
369, Sangdo-ro, Dongjak-gu, Seoul
Korea
ymkim828@ssu.ac.kr

ABSTRACT

Recently, as various platforms for contents such as movies, dramas, and webtoons have appeared, a method of using contents by using a website without downloading contents through in real time streaming has emerged as a way to use illegal contents. Most of these copyright infringement crimes are avoiding crackdowns and investigations through methods such as having a server abroad or using a cloud service to disguise the IP of the operating server. In this paper, we propose an illegality judgment system for cloud-based streaming videos and webtoons by building the signature DB that can check whether the distributed videos and webtoons are illegal or not.

KEYWORDS

Admissibility of evidence, Metadata, Cloud forensics, Signature, Feature point extraction.

1 INTRODUCTION

Recently, as various platforms servicing content such as movies, dramas, and webtoons have appeared, various methods using illegal content are also emerging. The traditional method using illegal content is to download and use the content through web hard or torrent, but recently, you can use the illegal content in real time

through streaming using the website without downloading the content. Most of these copyright infringement crimes are avoiding crackdowns and investigations through methods such as disguising the IP of the operating server using a server overseas or cloud(Google, Azure, AWS, etc.) services[1–3]. A representative case of copyright infringement using cloud services is related to video and webtoon contents in Korea[4]. In this paper, we propose a method for developing illegality judgment system for cloud-based streaming videos and webtoons that enables content distribution and service stakeholders to self-control by establishing a signature DB that can check whether the distributed video and webtoon content is illegal or not.

2 AN ILLEGALITY JUDGMENT SYSTEM FOR CLOUD-BASED STREAMING VIDEOS AND WEBTOONS USING SIGNATURE DB

The illegality judgement method for cloud-based streaming videos and webtoons proposed in this paper judges the illegality of contents provided by illegally operated websites through the extraction of the signature of the streaming videos and webtoons, which is shown in Fig. 1.

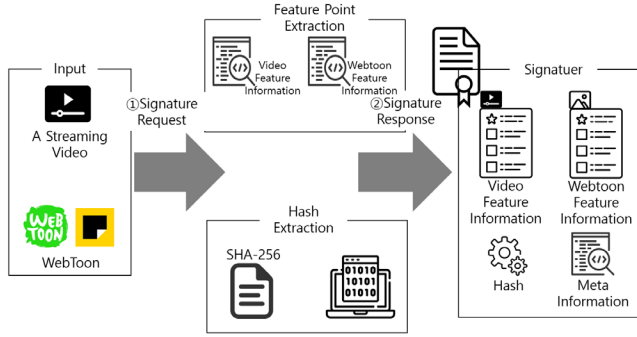


Figure 1: Streaming video and webtoon signature extraction process.

First, in order to determine whether the streaming video and webtoon are illegal, a signature descriptor for the streaming video and webtoon identified on the illegal website is requested. The signature descriptors stored in the DB are diverse, such as feature information and hash information for streaming videos and webtoons. In addition, the URL and IP address, which are the information on the website, are also included, and the content of the post (title, content, date, etc.) is also constructed as metadata and created as a signature descriptor. In other words, the generated signature descriptors are diverse including feature information, hash values, and website metadata for streaming videos and webtoons. Second, the original signature descriptor is compared based on the received signature descriptor. The generated signature descriptor is a streaming video and webtoon signature descriptor created by an illegally operated website. It is compared with the previously constructed original signature descriptor to determine whether it is illegal or not, as shown in Fig. 2.

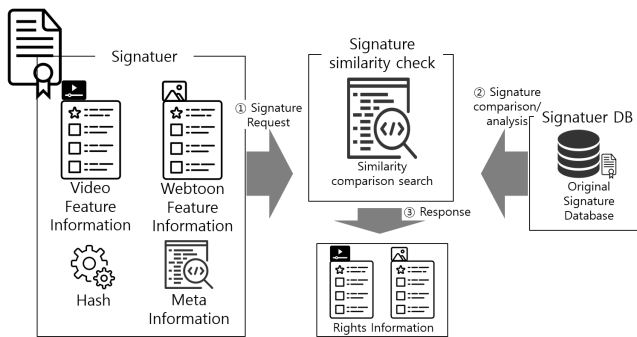


Figure 2: Process of illegality judgement by comparison of streaming video and webtoon signatures.

3 CONCLUSIONS

In this paper, we have proposed a signature descriptor for illegality judgment of cloud-based streaming videos and webtoons to build a safe ecosystem of K-contents by developing a specialized copyright investigation tool for copyright infringement investigation based on technologies such as DNA DB and voice information similarity verification. By developing the work signature DB so that anyone

can freely register/manage their work without any specific knowledge, a new ecosystem where copyrights can be recognized by registering his or her own works can be built. In this way we can deviate from the previous copyright infringement investigation paradigm where the copyright investigator investigates and discovers the illegal distribution platforms and finds out the original copyright holders for the discovered contents. As a future study, it is necessary to work on the creation research of signature descriptors for streaming videos and webtoons.

ACKNOWLEDGMENTS

This research project supported by Ministry of Culture, Sport and Tourism(MCST) and Korea Creative Content agency(KOCCA) in 2022(R2022020109).

REFERENCES

- [1] M. D. Kim and K. Y. Lee, "Review on the Legality of Acquiring Digital Evidence in Cloud Storage," Contemporary Review of Criminal Law (CRCL.PS), vol. no.72, pp 91-124, 2021.09.
- [2] W. Choung and Y. Kim, "A Study on the Search and Seizure of User Information in Cloud Computing Service," Lawyers Association journal, Vol.70 No.3, pp 155-189, 2021. 03.
- [3] W. S. Lee, "A Study on the Collection of Digital Evidences in Cloud Computing Environment," Contemporary Review of Criminal Law (CRCL.PS), Vol.0 No.38, pp 174-217, 2013.
- [4] D. Y. Kim, H. W. Park, S. V. Jadhav, S. H. Lee, H. D. Yoon and J. D. G. Ryu, "Feature extraction for the identification of webtoon in frequency domain," The Magazine of the IEIE, Vol.2016 No.6, pp 822-824, 2016.