

NEC Develops Video Content Identification Technology that Detects Illegal Copies in a Matter of Seconds

May 7 2010

NEC Corporation announced today the development of a video content identification technology that detects illegal copies of video content uploaded to the Internet in a matter of seconds.

This technology generates a fingerprint (video signature) to identify [video content](#) then compares video signatures to the signatures of original content in order to detect copies or altered versions. Therefore, altered video content, such as caption overlays, camera captured copies and analog copies, can be quickly and accurately detected.

This new technology enables content holders and service providers to automatically detect illegal copies and prevent illegal upload of video content on the Internet by registering original video content. These developments are expected to significantly reduce the time and cost of manual content inspections as well as improve the scale and accuracy of content assessment.

This technology has been approved by the ISO/IEC JTC 1/SC 29 as the MPEG-7 Video signature tool, international standard for video identification.

These video content identification technologies feature the following:

1. Accurate detection of copied or altered video content

Video signatures are extracted for each frame based on differences in the luminance between sets of sub-regions on a frame that are defined by a variety of locations, sizes, and shapes. Video signatures represent a unique fingerprint that can be individually detected frame by frame. This technology is capable of accurately detecting video content with that was created with such editing operations as analog capturing, re-encoding and caption overlay, which was conventionally very difficult to detect.

2. A high detection rate and low false positive rate for all video contents
By estimating confidence of signatures generated from each frame and using the confidence for sequence identification, the technology achieves a high detection rate with a very low false positive rate. These technologies achieved an average detection rate of 96% at a very low false alarm rate of 5ppm (5 in one million) through tests conducted by the international standardization organization.

3. Detection of short video scenes

Due to the high identification capability of signatures, the technology is capable of accurately detecting video scenes as short as 2 seconds (60 frames), which was formerly impossible when using conventional methods.

4. Compatibility with home PCs

By designing a compact signature size of 76 bytes per frame, the storage memory required for the matching process is minimized. As a result, a home-class PC can match approximately 1,000 hours of video in 1 second.

Due to the proliferation of video distribution services on the Internet, the detection and deletion of illegally distributed and copied video content (copyright infringement) has become a crucial issue for content holders and service providers. This problem has conventionally been addressed

by manual inspection which is incapable of accurately tracking the constantly growing volume of Internet content. In order to solve this issue, various automatic detection tools have been proposed, such as digital watermarks where content is embedded with special code, and the use of image retrieval technology. However, it was prohibitively difficult to accurately inspect large databases, short content or video produced through various editing operations. These new technologies resolve each of the above issues.

Looking forward, [NEC](#) will further develop this technology in order to provide a variety of applications that establish a content distribution structure where all video rights are respected.

This technology was approved as the Final Draft of International Standard of ISO/IEC 15938-3/Amd.4 at the 92nd ISO/IEC JTC 1/SC 29 WG11 (MPEG) meeting held in Dresden, Germany from April 19 to 23, 2010. The standard is expected to be published in September 2010, following approval from ITTF member countries.

This newly developed technology will be demonstrated at the 13th Embedded System Expo at Tokyo Bigsite between May 12 and 14.

Provided by NEC

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