Anti-counterfeiting and anti-piracy technology guide

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Digital Watermarks

Watermarks are one of the oldest authentication techniques around and are well known for their use on physical products, such as paper money. Now watermarks also exist in the digital world. For instance, a video purchased on a video-on-demand (VOD) website will bear a personalised watermark containing the client's ID, allowing unauthorised distribution of copyrighted content to be tracked.

Used for	Goes on	Can be used for
✓ Authentication	✓ Product	✓ Digital products
✓ Tracking/Tracing		
✓ Anti-tampering / Anti-alteration		

Visibility	Reading device needed	Connection to server
✓ Visible	✓ Yes	✓ Yes
✓ Invisible		✓ No

Description

A digital watermark is a piece of information that is permanently embedded in a digital file, certifying its authenticity and source. That information may be visible (for example, a television channel's logo in the corner of a video), or invisible (for example, an imperceptible alteration of pixels in a certain segment of a video). An invisible digital watermark can only be decoded by a computer program or a machine.

Digital watermarks may be private (detectable only to those who have the original unmarked file or know how to interpret the meaning of the marking), or public (detectable and clearly comprehensible, even to those who are not familiar with the original content).

Watermarks can also be either fragile or robust depending on their resistance to alteration, that is, their ability to withstand changes made to the data in which they are embedded. Robust watermarks will still be able to prove or guarantee file ownership even after the content of the file has been significantly modified. Visible watermarks are in general less robust.

Uses

Digital watermarks are primarily used in the field of multimedia content production. They are embedded in DVDs, CDs, software, e-books, TV programmes and, increasingly, in online content of all kinds (audio, video and image files, as well as texts and documents).

There are several different types of digital watermarks, each of which has a different specific function and purpose.

- 'Content-ID' watermarks identify protected content by creating a unique ID that is associated to a specific copyrighted work.
- 'Owner-ID' watermarks show information about the copyright holder.
- 'User-ID' watermarks prevent and/or track the source of unauthorised copies.

- ‘Network-ID’ watermarks trace the commercial path of the file by adding information related to the broadcaster or distributor.
- Generic watermarks are used for more general tasks, for example, to indicate whether a file is for internal, promotional or public use, whether it is copyrighted or free to use, whether it is complete or incomplete, etc.

Implementation

If you want to use digital watermarks, you will need to ensure you have the processes in place to embed the information in your digital files during production. You will also need to develop and implement a watermark tracking database and detection method.

Cost

The more robust the watermark, the higher the cost. Moreover, assigning a unique watermark to each copy of a given product is costlier than having one watermark for all copies. The costs involved in setting up the watermark recognition software and maintaining the reference database, if needed, should also be considered.

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