

Why Watermark?

The Copyright Need for an Engineering Solution

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ABSTRACT

An important research component in the creation of the National Gallery of the Spoken Word (NGSW) is the development of watermarking technologies for the audio library. In this paper we argue that audio watermarking is a particularly desirable means of intellectual property protection. There is evidence that the courts consider watermarks to be a legitimate form of copyright protection. Watermarking facilitates redress, and represents a form of copyright protection that universities can use without being inconsistent in their mission to disseminate knowledge.

Keywords

Copyright, watermarking, DMCA

1. INTRODUCTION

Research on watermarking digital sound is integral to the creation of the NGSW, an extensive on-line audio resource whose development is being sponsored by the Digital Library Initiative (Phase 2). An overview of the engineering issues, including the state-of-the-art of watermarking and quality concerns, was presented at the First Joint Conference on Digital Libraries in Roanoke [1]. The accompanying paper allowed little opportunity to explain the copyright issues that make audio watermarking a desirable technology. Any copyright enforcement is objectionable to some, but it is part of the law and will not go away. In this article we argue that audio watermarking is a preferable protection mechanism because it does not abrogate fair use rights.

2. COPYRIGHT AND AUDIO MATERIALS

Most sound recordings have some form of copyright protection under existing law. The US copyright Law (Title 17 of the US Code) explicitly protects sound recordings made since 1978 [2]. The protection rules for earlier recordings are significantly more complex. Recordings since 1972 have protection under the Sound Recordings Act (1971), which included the rights of reproduction, distribution, and adaptation [3].

Two viable interpretations of the copyright status of pre-1972 works exist: either the recordings represent unpublished works (since they do not meet the usual, very specialized copyright definition of publication), or they fall under state law. As unpublished works they would have protection until 2003, after which the usual “life-of-the-author-plus-70-years” rule would apply. For works protected under state law the situation varies widely, with some states applying common law, others having idiosyncratic rules which may have been repealed since the 1976 federal law came into force.

Some famous speeches have been heavily litigated. An example is Martin Luther King’s “I Have a Dream” speech, to which federal courts granted protection in the Mr. Maestro decision [4], then removed it and recently restored it [5]. The grounds on which courts have based the King decisions depended on the breadth and timing of the distribution of print versions of the speech. In this case the sound recording represents a performance of the text, even though the actual original text was significantly different.

Although speeches by Federal Government employees on federal business should fall in the public domain [6], the broadcasters who record them could in theory claim rights in original elements of the recording itself. This has generally not happened, but no case law has ruled it out.

Many rights holders are willing to make their sound recordings available for educational purposes, but they often require some form of technological protection to prevent legitimate educational copies from being used for unauthorized commercial purposes.

3. TECHNOLOGICAL PROTECTION

The 1998 Digital Millennium Copyright Act (DMCA) introduced penalties for circumventing technological protections. Many in the academic community object to these penalties because they create a contradiction in US law: many legal “fair uses” of technologically protected works can be exercised only through illegal circumvention. The Association of Computing Machinery wrote to the Library of Congress during the two year rule-making hiatus, and urged that “[t]he legislation must be revised to ensure the freedom of scientists to bypass copy protection schemes for fair use purposes” [7]. The final report from the Copyright Office of the Library of Congress did not

accept this or similar recommendations, arguing that the “causal relationship between the problems identified and Section 1201 [i.e. 17 USC 1201] are currently either minimal or easily attributable to other factors...” [8]. Thus the anti-circumvention measures remain intact.

The DMCA also prohibits the manufacturing of the means to circumvent protections. This has led to the arrest of Dmitry Sklyarov in July 2001 for creating a program which “allegedly is primarily used to circumvent limitations placed on e-books by publishers and distributors (such as technological restrictions that prevent copying)” [9]. This action can be read as an intention to enforce the anti-circumvention provisions vigorously.

Objection to the DMCA derives in part from the approach most technological protection mechanisms take: they block access. Encryption keys and anti-copying measures do not distinguish between legitimate academic fair uses and inappropriate exploitations. These measures also make the use of protected works so cumbersome that using illegal circumvention tools becomes attractive. Many universities balk at using such technological protections for licensed materials, despite growing pressure from rights holders.

Watermarking offers a less cumbersome method of protection that does not inhibit fair use, but assists in establishing legitimate legal redress through the courts when a genuine infringement occurs. To do this, a watermark must be robust to deliberate attacks and inadvertent distortion (e.g. due to coding or channel noise) even in small “fair use” segments of the original. Ideally it is also “transparent” to the user of the material in that it does not perceptibly distort the audio, image, or video content. Balancing the need for robustness and perceptual transparency represents a major engineering challenge.

4. WATERMARKS AS PROTECTION

There is evidence that the courts consider audio watermarks to be a legitimate form of copyright protection. The recent Napster case, for example, mentions both the lack of watermarking on MP3 files and the intention to include it in the future: “Generally speaking, the next phase of SDMI [Secure Digital Music Initiative] will concern two forms of digital rights management technology: encryption and watermarking” [10]. This provides an important link between general concepts of “copyright protection systems” and watermarking as a specific technique.

Attempts to remove the watermark in a sound file, or to build tools to find and destroy watermarks, could lead to more Sklyarov-style arrests, but watermarking eliminates the appeal of such illegal tools by allowing legitimate fair use without effort. Only those using a work for illicit purposes would have an incentive to break the protection.

Watermarking is not a preventative. It is not the digital equivalent of the medieval chains that locked valuable books to the wall to keep readers from carrying them away

or copying them. Instead it works more like existing protections for books, where browsing, quotation, and making private copies are tolerated within a set of rules, and leaves it to the courts to decide whether intellectual property rights have been infringed.

Prevention is attractive to those who put significant capital toward the creation of audio works, and who fear the loss of investment and future profits. But prevention is fundamentally inconsistent with most of the US copyright law, which instead emphasizes mechanisms for redress once an infringement has occurred. Watermarking facilitates redress, and represents a copyright protection technology which universities can use without being inconsistent with their interest in and commitment to sharing knowledge.

ACKNOWLEDGMENTS

This material is based upon work supported by the National Science Foundation under Cooperative Agreement No. IBIS-9817485. Opinions, findings, or recommendations expressed are those of the authors and do not necessarily reflect the views of the NSF.

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