Chapter XII
An Advanced Watermarking Application for the Copyright Protection and Management of Digital Images of Cultural Heritage Case Study: “Ulysses”

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ABSTRACT

The issue addressed in this chapter is the design, implementation, and evaluation of a watermarking application, especially focused on the protection of cultural heritage. The application described here is focusing on protecting digital surrogates of high-quality photographs of artifacts, monuments and sites, and on countering copyright infringement of online digital images. This is achieved by the integration of an innovative watermarking method to a specialized and usable user–interface. The system is specifically applied to “Ulysses,” the Official Cultural Portal of the Hellenic Ministry of Culture (HMC). The chapter is structured in 7 main sections where an overview of the issue is presented, the watermarking method is analyzed, and the user-interface is described in detail. Finally, an evaluation of the overall watermarking application is presented and specific on-site implementation issues are analyzed.
INTRODUCTION

The Origins of the Problem

The great value of cultural content is by now well recognized as it relates directly not only to culture in general but to important and vast markets, mainly Education, Tourism, Entertainment and Research. Wide access and delivery of valuable content raise several critical issues, pertaining to management, protection and exploitation of digitized cultural content. These include the critical problem of IPR (Intellectual Property Rights), protection and the unauthorized use and exploitation of digital data (“electronic theft”). Besides economical and other implications, such problems create considerable skepticism to cultural organizations and individual content owners. As a result content of great educational and economical value is often held secret and private.

The issue is gradually becoming critical mostly due to the following reasons:

1. Advances in technology have improved the ability to reproduce, distribute, manage and publish information (CSTB, 99). Reproduction costs are much lower for both right holders (content owners) and infringers, and digital copies are perfect replicas. The average computer owner today can easily do the kind and the extent of copying that would have required a significant investment a few years ago. The computer networks have changed the economics of distribution. Networks enable sending multimedia content worldwide, cheaply and at a high speed. As a consequence, it is easier and less expensive both for a rights holder to distribute a work and for an individual to make and distribute unauthorized copies. Finally, the World Wide Web has altered at a fundamental way the publication of information, allowing everyone to be a publisher with worldwide reach. The variety of documents and multimedia content of all sorts on the Web demonstrate that many people worldwide are making use of that capability. This is affecting the Cultural Sector too.

2. The information structure has been integrated into everyday life, affecting directly the intellectual property legislation (House, 98). Today, actions that can be taken casually by the average citizen – downloading files, forwarding information found on the Web – can at times be violations of intellectual property laws. Others as such as making copies of information for private use may require difficult interpretation of the law simply to determine their legality. Consequently, individuals in their daily lives have the capability and the opportunity to access and copy vast amounts of digital information, yet lack a clear picture of what is acceptable or legal. On the other hand, the necessary amendments of the copyright legislation in several cases do not cope with the entirety of the problem, resulting in certain legislative weaknesses.

The issue of copyright infringement in the Cultural Heritage sector is mainly observed to the commercial exploitation of digital images. Some prevailing examples of copyright infringement especially for digital images of Cultural Heritage could be viewed in many corporate web sites, where the unauthorized commercial exploitation of digital images is conducted in an every day basis. This improper exploitation of digital images is proving the lack of awareness of both content holders and content users.
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