



ANTI PIRACY SCREENING SYSTEM: MOVIE PIRACY TRACKING USING TEMPORAL VISUAL MODULATION

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ABSTRACT

Cinema is a major entertainment for people in today's life. To entertain people a lot of investment is put on cinemas by the film – makers. Their effort is being ruined by few people by pirating the cinema content. They do it by capturing the video in mobile camera and upload it to websites or sell it to people and this goes on. In this paper, a technical method to prevent video recording in movie theatres is presented. An invisible light is projected from the screen to the whole audience that falls on the cameras which are optically sensitive to infra-red light in turn disturbing the acquisition functions of any camera making an illegal recording in the theatre useless. Nowadays, camcorder piracy has great impact on the motion picture industry. Although some watermarking technologies can track the movie pirate, the video content viewed in the theatre may be affected and they cannot obstruct the need of pirated movie because the watermarks in pirated movies are invisible. This paper presents a new method to defeat camcorder piracy and realize content protection in the theatre using a new paradigm of information display technology, called Temporal visual Modulation (TVM), which utilizes the differences between the human-eye perception and digital camera image- forming to stack an invisible pattern on digital screen and projector. The images formed in human vision are continuous integration of the light field, while discrete sampling is used in digital video acquisition which has “blackout” period in each sampling cycle. Based on this difference, we can decompose a movie into a set of display frames with specific patterns and broadcast them out at high speed so that the audience cannot notice any disturbance, while the video frames captured by camcorder will contain highly objectionable artifacts (i.e., the patterns). The pattern embedded in the movies can also serves as tracking information to reveal the one responsibility for the camcorder piracy.

Keywords: Camcorder piracy, Display technology, Invisible pattern, Temporal Visual Modulation (TVM), Watermarking technologies.



1 INTRODUCTION

1.1 A Brief Review of Movie Piracy

In today's age the growth of the Internet has led to many new innovations in the way it is used. Internet can provide fast access to any kind of information and media, and also the copyrighted contents. "Piracy refers to the unauthorized duplication of copyrighted content that is then sold at substantially lower prices in the 'grey' market". Final copy of the movie content might get leaked before its release by the multiple teams working on them. The more common method is to film the movie inside a theatre and then uploading it on Websites or convert them to DVDs and sell them on the streets. Most box office releases are available online within a few days or even hours of the box office release. Hindering piracy has always been priority number one for movie theatres. The markets around the world have tried to take on the issue of piracy through policing and prosecution. Copyright law protects the value of creative work. Making unauthorized copies may subject one to civil and criminal liability. Night vision goggles are provided to movie hall staffs which would help them to notice any audience trying to record a movie while screening. Movie piracy has a profound impact on the motion picture industry. The Motion Picture Association of America (MPAA) [1] conducted an investigation on the movie piracy in 2005. According to the statistics in the report, the major U.S. motion picture studios lost 6:1 billion or more annually. These losses in revenue will obviously cause serious financial problems for the studios and even contribute to their current downfall. In 2010, for example, over one million copies of James Cameron Avatar were downloaded illegally in just seven days [2]. In the view of the law, movie piracy is considered as crime all over the world. As an important source of movie piracy, the camcorder piracy accounts for about 23% of the piracy methods according to the BBC News [3]. As the source of infringing DVDs, camcorder movies spread rapidly on the internet.

1.2 Existing System

The existing describes a system where in IR signals are transmitted towards movie audiences in the theaters which will wash out any silicon-CCD (charge coupled devices)-based digital camcorders, which makes the recorded video content unfit for illegal marketing.

1.3 Drawback of Existing System

The disadvantage of the existing system is it just blocks but it won't detect the location where piracy is happening.

1.4 Overcoming the Drawbacks

Instead of treating every movie goer as a potential pirate, an anti-piracy screening system can be implemented in order to make the pirate copy useless as well as having no effect on the audience. Here, we are overcoming this drawback by using Steganography (digital watermarking) and Temporal Visual Modulation (TVM) technique to detect the location where the piracy has taken place.