A Collusion Attack Optimization Strategy for Digital Fingerprinting

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Collusion attack is a cost-efficient attack for digital fingerprinting. In this article, we propose a novel collusion attack strategy, *Iterative Optimization Collusion Attack (IOCA)*, which is based upon the gradient attack and the principle of informed watermark embedding. We evaluate the performance of the proposed collusion attack strategy in defeating four typical fingerprinting schemes under a well-constructed evaluation framework. The simulation results show that the proposed strategy performs more effectively than the gradient attack, and adopting no more than three fingerprinted copies can sufficiently collapse examined fingerprinting schemes. Meanwhile, the content resulted from the proposed attack still preserves high perceptual quality.

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1. INTRODUCTION

With the rapid development of multimedia and communication technologies, the quantity of digital content continues to increase. It is becoming easier to share multimedia content through the Internet. However, this benefit also brings ease to unauthorized use of multimedia content, such as illegal duplication, processing, and redistribution. The protection of multimedia content is becoming increasingly critical for the work's owner and the authorized distributor. Digital fingerprinting is a technology which aims at identifying users exploiting their multimedia content for unexpected purposes by embedding unique marks with traceability. Collusion attack is known to be a cost-effective attack, where a group of users combines multiple copies of the same multimedia content to generate a new version. With

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