



Return to Zero Patchwork Method in the Audio Watermarking System

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Abstract

The technique of adding information to a host audio signal in a way that makes it difficult for unauthorized people to extract is known as audio watermarking. With the increment of information that is transferred over the internet, watermarking is becoming more and more necessary. In order to comply with multimedia copyright, including image, audio, and video data, protection techniques are required. In particular, digital media watermarking has involved the use of numerous algorithms. Patchwork watermarking is one of them and offers a statistical way to manage robustness and imperceptibility. The main concept is to alter the mean value difference between two sets in accordance with the watermarking bits that will be embedded. Imperceptibility, security, and robustness are the key performance matrices that are being used to measure the power of an original watermarking technique. The existing patchwork-based audio watermarking techniques have not performed equally better in all three matrices. This research paper presents a high-performance watermarking technique; called the return-to-zero approach that is resistant to popular attacks such as amplitude scaling. Amplitude scaling is used to model the attacks and validate the process in audio watermarking. The sample values are set to zero before the watermark embedding process in this return-to-zero approach. These index locations undergo additional processing at the watermark embedding process. The number of bits decoded correctly (successful rate) and correlation factor in this method are both one, with and without the use of amplitude scaling attacks. We demonstrate that compared to typical amplitude scaling-type attacks, this return-to-zero strategy shows better performance in terms of imperceptibility, robustness, and security.

Keywords: *Amplitude Attack, Audio Watermarking, Copyright Protection, Return to Zero Method, Time Domain.*

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