Spread Spectrum Audio Watermarking Using Vector Space Projections

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ABSTRACT

Efficient watermarking techniques guarantee inaudibility and robustness against signal degradation. Spread spectrum watermarking technique makes it harder for unauthorized adversary to detect the position of the embedded watermark in the carrier file, because the watermark bits are spread in the carrier medium. Unfortunately, there is a high possibility that synchronization of the watermark bits and carrier bits will go out of phase. This will lead to watermark detection problem in the carrier bit sequence. In this paper, we propose a vector space projections approach on spread spectrum audio watermarking technique, in order to presents both the watermark bits and carrier bits as vectors. Similarities of watermark vector to a carrier vector are resolve by the normalized dot product of the cosine of angle between them for embedding. After embedding and extraction by the technique, signal processing methods in the form of attacks were applied. Our approach proved robust when compared with other audio watermarking techniques. This technique gives good results and was found to be robust on performance test.

KEYWORDS: Computational Intelligence; Artificial Intelligence

DOI: 10.1007/978-3-319-11218-3_28