A robust audio watermarking scheme based on reduced singular value decomposition and distortion removal. (English) [Zbl 1217.94128]


Summary: This paper presents a blind audio watermarking algorithm based on the reduced singular value decomposition (RSVD). A new observation on one of the resulting unitary matrices is uncovered. The proposed scheme manipulates coefficients based on this observation in order to embed watermark bits. To preserve audio fidelity a threshold-based distortion control technique is applied and this is further supplemented by distortion suppression utilizing psychoacoustic principles. Test results on real music signals show that this watermarking scheme is in the range of imperceptibility for human hearing, is accurate and also robust against MP3 compression at various bit rates as well as other selected attacks. The data payload is comparatively high compared to existing audio watermarking schemes.

MSC: 94A62 Authentication, digital signatures and secret sharing

Keywords: audio watermarking; singular value decomposition; MP3; distortion removal; psychoacoustics

Software: StirMark

Full Text: DOI

References:


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