Abstract

Transform-domain digital audio watermarking has a performance advantage over time-domain watermarking by virtue of the fact that frequency transforms offer better exploitation of the human auditory system (HAS). In this paper, an innovative watermarking scheme for audio signal based on double insertion of the watermark in DWT-DST domain of the host signal is proposed. We are using a gray scale logo image as watermark instead of randomly generated Gaussian noise type watermark. Subjective and objective tests reveal that the proposed watermarking scheme maintains high audio quality and is simultaneously highly robust to different attacks, including MP3 compression, low-pass filtering, amplitude scaling, additive Gaussian noise, reacquisition, cropping, sampling, high pass filtering. Comparison of the proposed algorithm with similar techniques such as Cox et al and Dhar et al, shows the superiority of the proposed scheme in term of robustness and imperceptibility.
A Secure and High Robust Audio Watermarking System for Copyright Protection

- L. Yaroslavsky, Y. Wang, "DFT, DCT, MDCT, DST and signal Fourier spectrum analysis," 10th European Signal Processing Conference, pp. 1065-1068, Tampere,
Finland 2000.

**Index Terms**

Computer Science
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**Keywords**

audio watermarking  DWT  PN-sequence  DST  FRIT  copyright protection  robust watermarking